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NEPHROLOGY WILEY

MINI ORALS

ENVIRONMENTAL SUSTAINABILITY

SAVING WATER, REDUCING WASTE: A COMPARATIVE STUDY OF INCREMENTAL VERSUS STANDARD DOSE PERITONEAL DIALYSIS ON WATER, DIALYSIS WASTE AND CARBON EMISSIONS

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Aim: To quantify the amount of water, plastic, carton, and potential carbon emissions saved through incremental peritoneal dialysis (PD), as compared to standard PD.

Background: Incremental PD may save water and reduce dialysis waste, but the extent of reduction in water and dialysis waste, compared with standard PD has not been quantified.

Methods: We compared the total water, plastic, and carton use, and potential carbon emissions associated with delivery of consumables, between incremental and standard dose PD within Western Renal Service, Sydney. These were calculated based on the number of PD exchanges/patient/day, adjusted to dose increments, versus standard PD.

Results: Of the 365 incident patients, followed for median time of 14 (IQR:19) months, 187 (51%) were prescribed incremental PD, 63% were male, 43% had diabetes as primary disease, and 34% had eGFR >10 mL/min (compared to 22% in the full dose group ($N = 178$)). 41 (22%), 45 (24%), 18 (10%) and 83 (44%) patients treated with incremental PD were prescribed 1, 2, 3 manual exchanges, and three 1.8-L cycles, respectively. This compared to 71 (40%) and 107 (60%) patients treated with four 2-L manual exchanges and four 2-litre automated PD cycles, respectively. Compared with standard PD, the incremental group used 114, 924 less PD bags, equating to savings of >4 M litres water, 18 339 kg plastic and 13 424 kg cardboard cartons, potentially reducing deliveries to patients' homes by 924, with associated carbon emissions by 9171 kg CO2-e.

Conclusions: Incremental PD requires less water, plastic, cartons and fewer deliveries to patients' homes compared to standard PD. In our cohort of incidental PD patients, this equated to a substantial reduction in waste and carbon emissions.

EXPERIMENTAL IMMUNOLOGY

RELB MUTATIONS AND A MODEL OF NEPHRITIS

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Aim: To study the mechanism through which RelB variants result in nephritis and autoimmunity.

Background: Glomerulonephritis is a significant autoimmune disease impacting patient survival. RelB is involved in the non-canonical NF-kB pathway, regulating immune responses including lymphoid organ development, T and B cell proliferation.NF-Kb pathway has been associated with kidney disease such as IgA nephropathy and lupus nephritis. RelB −/− mice develop a phenotype marked by early multi-organ failure but normal kidney function. We identified a RelB variant that develops lethal kidney failure in mice at 4–6 weeks of age.

Methods: RelB knockout mice were generated using CRISPR/Cas9 with crRNA guides to alter exon 8. Absence of RelB protein was confirmed by Western Blot for the n and c-terminus of RelB. Organs were harvested for histopathological analysis. Spleen and thymus were harvested for immunophenotyping with flow cytometry. Serum was analysed for inflammatory cytokine changes.

Results: Mice developed end organ kidney failure by 6 weeks. Glomeruli were globally sclerosed and no active nephritis lesions identified. Liver and lung histology demonstrated organ inflammation known to occur with Relb−/− mice. There was a marked decrease in

splenic mature B cell and thymic T cell populations. Myeloid lineages showed significant increases in neutrophils and Ly6c high monocytes. Splenic T cell populations showed increased Tregs and activated CD4+ cells. No significant changes in serum inflammatory cytokines were identified.

Conclusion: We identified a novel process where RelB variants alone can cause fulminant glomerulonephritis. This novel mouse model of nephritis serves as a possible avatar to study human glomerulonephritis and represents an important insight into populations with RELB variants and glomerulonephritis.

EXPLORING THE IMPACT OF INTERLEUKIN-37 ON PRO-INFLAMMATORY PATHWAYS IN TWO MODELS OF KIDNEY DISEASE

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Aims: To determine the impact of human interleukin-37 (IL-37) overexpression on renal pro-inflammatory gene expression in two models of kidney disease.

Background: IL-37 is upregulated in response to inflammation and exerts anti-inflammatory properties by preventing IL-18 signalling. Previously, we established causal relationship between IL-18 and the onset of hypertension and kidney impairment, yet the role of IL-37 in regulating IL-18 signalling in kidney disease is unknown.

Methods: Two models of kidney disease were investigated using male C57B6 mice. Firstly, wild-type (WT) and IL-37 overexpressing mice (IL-37Tg) mice underwent uninephrectomy and treated with deoxycorticosterone acetate (2.4 mg/d, s.c.) and saline (0.9%) drinking water (1K/DOCA/salt) and culled after 21 days. Secondly, WT and IL-37Tg mice underwent unilateral ureteral obstruction (UUO) and were culled after 7 days. Kidneys underwent histopathological and gene expression analysis.

Results: Both models of kidney disease had an altered histoarchitecture, showing tubular atrophy, concurrent with increased collagen deposition ($P < 0.05$ vs. WT). The DOCA model demonstrated elevated mRNA expression of Col1a1 and Col3a1 (both $P < 0.005$) compared to WT sham and upregulation in expression of Pro-Il-18 ($P < 0.01$), Ccl2 ($P < 0.0001$), Il-18 bp, Il-6, Vcam, Ccl5 and Icam ($n = 5–13$, all $P < 0.05$) compared to WT sham. Similarly, WT UUO mice exhibited an upregulation in expression of Il-18bp, Il-18r1, Il-18rap, Il-1β ($n = 8$; all $P < 0.001$). IL-37Tg mice exhibited a significant increase in IL-37 mRNA ($P < 0.0001$) yet had no effect on fibrosis or pro-inflammatory genes in both models. Interestingly, Pro-IL-18 expression was blunted in IL-37Tg mice ($n = 13$; $P = 0.0268$) compared to WT 1 K/DOCA mice, yet downstream cytokines Icam, Vcam, Il-6, and Ccl2, remained unchanged.

Conclusion: IL-37 does not seem be protective against increases in IL-18 signalling in two models of kidney disease.

EXPERIMENTAL TUBULOINTERSTITIAL DISEASE

INTERVENTION WITH AN NLRP3 INHIBITOR DOES NOT PREVENT CARDIOVASCULAR AND CYSTIC BURDEN IN A PRE-CLINICAL MODEL OF POLYCYSTIC KIDNEY DISEASE

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Aim: Determine if NLRP3 inflammasome is implicated in polycystic kidney disease (PKD), and if a small molecule inhibitor (MCC950) can limit cardiovascular and cystic burden.

Background: NLRP3 inflammasome activity is linked to hypertension and kidney damage, but its role in PKD-related hypertension, inflammation, and cyst growth is unclear.

Methods: Male ($n = 8$) and female ($n = 8$) Lewis Polycystic Kidney (LPK) rats and littermate controls (WT, 7 males, 8 females) received daily SC injections MCC950 (20 mg/kg) or placebo (saline) from 6 to 16 weeks of age. Blood pressure (BP) was measured via tail cuff. Serum and kidneys were analysed for kidney function and histopathology.

Results: At baseline, all LPK animals (192 mmHg) had higher blood pressure compared to WT (152 mmHg, $p < 0.001$) which remained until 16 weeks of age. LPK animals had worse kidney function at endpoint measured by urine and serum analysis (both $p < 0.05$). LPK animals had larger kidneys, spleens and hearts (all $p < 0.0001$) compared to WT animals. Histological analysis showed large cysts and increased collagen deposition ($p < 0.0001$) in LPK animals, and NLRP3 localisation in macrophages. Intervention with MCC950 reduced blood pressure only in male LPK animals at 10 weeks of age compared to placebo (173 mmHg vs. 195 mmHg, $p < 0.0069$), yet was not sustained. MCC950 did not preserve kidney function or reduce organ weights in LPK animals, nor affect collagen deposition. There was a trend for MCC950 to decrease the number, but not the size of cysts.

Conclusion: Intervention with MCC950 in PKD may have BP lowering effects in males only, early in disease. However, this study did not show improvement in cardiovascular or cystic burden in both male and female LPK animals when treated with MCC950.

INCREASED SEVERITY OF ACUTE KIDNEY INJURY IN OBESE MICE

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Aim: To investigate the impact of obesity from a high fat diet (HFD) on acute kidney injury (AKI) using the folic acid nephropathy (FAN) model.

Background: Obesity is a lipotoxic state of abnormal and excessive fat accumulation. Although obesity is a well-known risk factor for chronic kidney disease, its role in AKI is not well understood.

Methods: Male mice aged 6- to 8-week-old received either HFD or control diet (CD) for 6 weeks. AKI was induced using FAN, in which intraperitoneal folic acid is administered at 240 ug/g. Control mice were administered vehicle. Kidneys and bloods were collected 48 hours post FAN for analysis.

Results: HFD mice demonstrated more severe AKI compared to CD mice following FAN as evidenced by worse serum urea (HFD 48.9 ± 4.9 mmol/L vs. CD 32.3 ± 19.8 mmol/L, $P = 0.035$), worse creatinine (HFD 0.09 ± 0.08 mmol/L vs. CD 0.03 ± 0.014 mmol/L, $P = 0.022$), increased NGAL expression by Western blot (HFD 10.8 ± 4.8-fold vs. CD 2.1 ± 1.3-fold) and RT-PCR (HFD 303.2 ± 117.5-fold vs. CD 184 ± 77.6-fold, $P = 0.004$). RT-PCR found that HFD increased the expression of inflammatory markers after FAN with increased IL-6 (HFD 214.6 ± 23.3-fold vs CD 108 ± 87.8-fold, $P = 0.014$) and increased MCP-1 (HFD 32.3 ± 15.9-fold vs. CD 12.8 ± 8.5-fold, $P < 0.001$). HFD mice showed worse histological injury score after FAN (HFD 3.43 ± 0.6 vs. CD 2.27 ± 0.9, $P < 0.001$). Notably, HFD increased tubular vacuolation in both FAN (HFD 3.5 ± 0.6 vs. CD 2.34 ± 0.6, $P < 0.001$) and vehicle treated mice (HFD 3.25 ± 0.8 vs. CD 1.93 ± 0.4, $P < 0.001$), consistent with lipid accumulation in tubular epithelial cells.

Conclusion: Our data indicate that obese mice accumulate lipid in tubular epithelial cells and develop more severe AKI and inflammation following FAN. Strategies to reduce obesity may improve outcomes in AKI.

CONSIDERING URINARY VOLATILE ORGANIC COMPOUNDS AS A NOVEL SOURCE FOR NON-INVASIVE DIAGNOSIS OF TUBULOINTERSTITIAL DISEASE?

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Aim: To explore the expression levels of urinary volatile organic compounds (VOCs) in patients with tubulointerstitial disease.

Background: Timely detection of kidney disease is important for early intervention. There is need to develop accurate non-invasive diagnostic methods as kidney biopsy whilst accurate, is costly and invasive. VOCs are gaseous products of metabolic processes in organisms which are conventionally released with greater abundance in disease conditions. Whether the presence of VOCs in urine have a considerable role in diagnosing kidney disease remains unestablished to date.

Methods: Individuals aged 18–75 years with kidney biopsy performed were included. All biopsy samples had an interstitial fibrosis and tubular atrophy (IFTA) grade scored by an accredited pathologist. Pre-biopsy urine samples were collected. Urine supernatant was extracted from residue, stored at −80°C, and defrosted overnight at 4°C before sampling for stir bar sorptive extraction (SBSE). The sample was then proceeded for gas chromatography–mass spectrometry (GC–MS) analysis. Post-processing of GC–MS data separated complex mixtures of VOCs based on their volatility and polarity. Mass-to-charge ratios and fragment patterns were measured for individual VOCs identification and quantification.

Results: 64 study participants were included (22 individuals no IFTA, 15 individuals mild IFTA, 27 individuals moderate/severe IFTA). The expression levels of 34 urinary VOCs were identified to be significantly associated with IFTA grading ($p < 0.05$). As per the human metabolome database - of these 34 VOCs, 4-Heptanone, Benzaldehyde, Nonanal and Benzene were previously detected in serum and faecal samples at abnormal expression levels among adult patients with kidney disease.

Conclusions: We report 34 urinary VOCs in which expression levels are associated with tubulointerstitial histopathology. Urinary VOCs may have a clinical diagnostic role in relation to tubulointerstitial disease.

GENERAL NEPHROLOGY—ACUTE KIDNEY INJURY

THE URAF AKI TOOL. A NOVEL, SIMPLE 6-POINT KPI FOR AKI WORKUP AND FOLLOW UP

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Aim: In this study we aim to determine whether appropriate workup and follow up was performed on adult inpatients

discharged with an acute kidney injury (AKI) from Tauranga Hospital, New Zealand, in August 2023. We created a novel 6-point KPI called URAF (Urinalysis (1 week), Renal imaging (1 week), Acid/base (24 h) and Follow up at 0, 30 and 90 days) as a benchmark for AKI workup and follow up.

Background: AKI commonly occurs in hospitalised patients and can result in permanent kidney damage and an increased rate of mortality. There is currently a lack of succinct key performance indicators to benchmark AKI workup and follow up in hospitalised patients to ensure that standards of care are met.

Methods: We applied the UK national AKI E-Alert algorithm 2014 to Pathlab data to identify all cases of AKI discharged from Tauranga Hospital in August 2023. We assessed their baseline characteristics, cause of AKI, workup, life-threatening complications and follow up at 0, 30 and 90 days. We applied our novel URAF criteria to all cases.

Results: We identified 128 patients with stages I, II and III AKI affecting 74, 29 and 25 patients respectively. For the "URAF workup" we identified that 63% had urinalysis and 41% had imaging within 1 week and 55% had a blood gas completed within the target time frames. For the "URAF follow up" we found that the rates of unresolved at AKI n(%) at 0, 30 and 90 days were 49 (38.3), 14 (10.9) and 6 (4.6) respectively.

Conclusions: The novel URAF criteria described in this study represents a simple 6-point KPI that can be followed to ensure timely workup and adequate follow up of AKI.

CASE OF RENAL HYPOURICEMIA WITH A HOMOZYGOUS MUTATION IN THE SLC22A12 GENE AND LITERATURE REVIEW

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Background: Renal hypouricemia (RHUC) is a globally rare autosomal disorder caused by inactivation of the uric acid transporter protein that affects proximal tubular reabsorption, resulting in increased serum uric acid excretion. It is usually asymptomatic, with an occasional minority of patients presenting with serious complications in the acute phase, such as exercise-induced acute kidney injury (EIAKI) and urolithiasis. Previous studies have suggested a genetic component in RHUC associated with mutations in the SLC22A12 and SLC2A9 genes. To date, more than 150 cases of SLC22A12 gene mutations and more than 20 patients with SLC2A9 gene defects have been reported worldwide.

Case Report: A-21-year-old young student presented to our hospital with sudden onset of nausea, vomiting and oliguria. Sanger sequencing was used to detect genetic mutations in the patient and his parents, and the results confirmed that the patient had a homozygous mutation in SLC22A12 gene.

Conclusions: We report a young patient with RHUC type 1 who presented with acute kidney injury after exercise, and refined DNA sequencing for family genealogy showed that the patient had a c. 269G > A (p.R90H) homozygous missense mutation, and both of his parents were carriers. This article analyses the clinical data and diagnostic reasons of RHUC patients by reviewing the literature from 1974 to the present day, which will help clinicians to diagnose RHUC. The results showed that 14% of patients were diagnosed with RHUC during routine check-up, suggesting that education on hypouricemia should be strengthened in our daily life, early detection and treatment should be carried out, reducing the risk of complications of hypouricemia (such as EIAKI). Not only should we pay attention to hyperuricemia but also hypouricemia.

GENERAL NEPHROLOGY—DIABETES/CARDIOVASCULAR/HYPERTENSION

NEW TRIAL ENDPOINTS: CAN THE SLOPE OF EGFR DECLINE BE AN EFFECTIVE SURROGATE FOR CLINICAL KIDNEY EVENTS WHEN ACUTE EGFR CHANGES ARE NOT MEDIATED BY GLOMERULAR HAEMODYNAMICS?

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Background: Glomerular Filtration Rate (GFR) decline is a proposed surrogate kidney endpoint in clinical trials. Estimated (e)GFR decline has been successfully modelled using eGFR slope, where the correlation between total and chronic eGFR slopes and clinical endpoints was established. Effective interventions in these prior studies exerted an initial eGFR decline mediated by glomerular haemodynamics. We tested the association of total and chronic eGFR slopes with clinical endpoints for fenofibrate, an agent with an acute eGFR decline mediated by non-glomerular actions.

Methods: The FIELD trial randomised adults to fenofibrate or placebo. Total eGFR slope was calculated using a repeated measures 2-slope linear mixed model for the entire intervention period. Sensitivity analyses were also performed limited to 3 years. Chronic eGFR slope was calculated from month 4. The clinical kidney endpoint was doubling of serum creatinine/eGFR<15 mL/min/1.73 m2/ renal death/kidney replacement therapy. Frequency of clinical kidney endpoints based on baseline to 8-week washout eGFR was an exploratory subgroup analysis.

Results: 9795 participants were followed for 5 years. A post-washout eGFR was ascertained in 94.3% of the washout sub-study participants. Fenofibrate was associated with a mean acute eGFR decline of −9.05 mL/min/1.73 m^2/annum. Fenofibrate slowed rate of chronic eGFR decline by 0.61 mL/min/1.73 m^2/annum (95% CI 0.50 to 0.71, $P < 0.0001$), but worsened total eGFR slope (mean diff −1.54, 95% CI -1.65 to −1.44, $P < 0.0001$). Fenofibrate use increased the clinical kidney endpoint (HR 1.48, 95% CI 1.16–1.89, $P = 0.002$). There was no difference for clinical kidney outcomes in washout analyses.

Conclusion: Results generally support use of eGFR slope change as a surrogate for clinical kidney endpoints. Assessment post-wash out should be considered for agents with a large acute eGFR decline.

THE ACUTE, REVERSIBLE EGFR RESPONSE ASSOCIATED WITH FENOFIBRATE IS NOT HARMFUL: A POST HOC ANALYSIS FROM THE FIELD TRIAL

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Background: Several agents protective against chronic kidney disease are associated with an initial estimated Glomerular Filtration Rate (eGFR) decline. Sodium-glucose cotransporter-2 inhibitor studies have found these eGFR dips are not associated with harm although analyses were post-randomisation. Fenofibrate leads to an acute, reversible eGFR decline by non-glomerular mechanisms. In a trial where the acute eGFR response to fenofibrate was assessed pre-randomisation, we aimed to test whether the acute eGFR decline predicts benefit.

Methods: The FIELD trial randomised adults to fenofibrate or placebo. All participants were exposed to an active run-in. The Acute Fenofibrate Response (AFR) was measured and categorised as nil, mild, moderate, or large (increase/no change, 0%–10%, 10%–20%, and >20% eGFR decline). Subgroup analyses were conducted for several cardiovascular outcomes, mortality, a clinical kidney endpoint (doubling serum creatinine, eGFR <15 mL/min/1.73 m2, renal related death, or kidney replacement therapy), and total (baseline to study close) and chronic (4 months post-randomisation to study close) eGFR slopes, with heterogeneity assessed using a test of trend.

Results: In 9777 participants, fenofibrate therapy did not reduce coronary events with no evidence of treatment modification by acute eGFR decline category (overall HR 0.89 [95% CI 0.75–1.05]); nil, mild, moderate, and large acute decline: 1.08, 0.77, 1.02 and 0.82 respectively, *p*-trend 0.997). AFR category did not predict harm for clinical kidney, total cardiovascular events, total microvascular events, or all-cause mortality (*p*-trend 0.97, 0.20, 0.46 and 0.95, respectively). Subgroups of greater AFR experienced more improvement on chronic eGFR slope, and the reverse trend for total slope (*p*-trend <0.0001 and 0.01, respectively).

Conclusion: There was no evidence that greater acute eGFR decline leads to fenofibrate-associated harm for a range of clinically meaningful endpoints.

ATRIAL FIBRILLATION IN ADVANCED CHRONIC KIDNEY DISEASE: A SURVEY OF CURRENT PRACTICE IN ANTICOAGULATION MANAGEMENT IN AUSTRALIA AND NEW ZEALAND (ANZ)

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Aim: To characterise current ANZ practice in management of atrial fibrillation (AF) in advanced chronic kidney disease (CKD).

Background: Stroke and bleeding risk are disproportionately high in advanced CKD. The benefit–risk ratio of oral anticoagulation (OAC) for stroke prevention remains uncertain.

Methods: This was an anonymous, electronic survey of 23 multiple-choice questions conducted over a 6-month period; targeted to nephrologists, cardiologists and respective trainees of their representative national societies.

Results: Responses from 181 clinicians (121 nephrologists, 60 cardiologists) were eligible for analysis. Whilst interdisciplinary collaboration was high (47%), 32% of all respondents reported that nephrologists were primary decision-makers regarding AF management in CKD. With increasing severity of CKD, use of OAC was more frequently based on individualised assessment rather than stroke risk based on CHA2DS2-VASc score. In CKD-4, 77% of respondents used CHA2DS2-VASc score to assess stroke risk; compared to 41% in CKD-5 and 20% in CKD-5D. Individualised assessments were used by 11% of respondents in CKD-4, compared to 28% in CKD-5 and 30% in CKD-5D. Bleeding risk was primarily an individualised assessment (65%) in CKD-5/5D, with a smaller proportion using the HAS-BLED score (32%). There was substantial intra- and inter-specialty heterogeneity in the use of OAC in CKD-5/5D. Cardiologists more frequently used the CHA2DS2-VASc score to guide OAC decision-making, compared to nephrologists across CKD stages. Nephrologists were more likely to avoid OAC use in CKD-5D (33%) compared to cardiologists (16%). Apixaban was the preferred OAC (63%) compared to vitamin-K antagonists (37%) in CKD-5/5D.

Conclusion: This study provides insights into the contemporary management of patients with AF-CKD; highlighting variations in practice and shared knowledge gaps which may be targets for education and research opportunities.

RENAL NEDD4L AS A POTENTIAL NEW REGULATOR OF GLUCOSE HOMEOSTASIS AND DIABETIC NEPHROPATHY

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Aim: To investigate NEDD4L as a new regulator of diabetes and diabetic nephropathy (DN).

Background: NEDD4L (mouse NEDD4-2) is a ubiquitin ligase that regulates ion channels and transporters by promoting their degradation, thereby affecting many signalling and physiological outcomes. We have demonstrated the importance of NEDD4-2 in the kidney, as loss of this gene in mice results in chronic kidney disease (CKD) due to aberrant ion transport, caused by elevated expression of NEDD4-2 substrates including ENaC (epithelial sodium channel). One of the biggest risk factors for CKD is diabetes, as up to 50% of diabetic patients develop DN. Variants of Nedd4-2 are associated with DN, therefore we hypothesized that this gene may regulate development of this disease.

Methods: NEDD4L/NEDD4-2 and substrate levels were measured in (i) human kidney biopsies with and without DN and (ii) at various stages in a mouse model of DN. CRISPR genetic reduction of Nedd4-2 was generated in mouse DN to investigate whether further deficiency of Nedd4-2 influences DN.

Results: NEDD4L levels were significantly reduced in patients with DN. In a mouse model of DN, reduction of NEDD4-2, and elevation of its substrates correlated with disease progression. Remarkably, genetic reduction of renal Nedd4-2 in the DN model did not exacerbate nephropathy but corrected blood glucose levels and metabolic parameters.

Conclusions: Renal NEDD4L/Nedd4-2 is a new regulator of blood glucose levels. Lower levels of this gene may be protective in DN and could serve as a biomarker for disease detection/severity and a potential future therapeutic target.

THE IMPACT OF BASELINE FRAILTY, MULTIMORBIDITY, POLYPHARMACY AND HEALTH-RELATED QUALITY OF LIFE ON THE EFFECTS OF EMPAGLIFLOZIN: POST-HOC ANALYSES FROM THE EMPA-KIDNEY TRIAL

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Aim: To assess the impact of frailty, multimorbidity, polypharmacy and health-related quality of life (HRQoL) on the effects of empagliflozin.

Background: Chronic kidney disease (CKD) is associated with higher rates of frailty, multimorbidity, polypharmacy and low HRQoL, but the efficacy and safety of empagliflozin among people with these attributes are uncertain.

Methods: EMPA-KIDNEY was a double-blind trial randomising 6609 participants with CKD (eGFR 20- <45; or 45- < 90 mL/min/1.73m^2 with urinary albumin-to-creatinine ratio ≥ 22.6 mg/mmol) to empagliflozin 10 mg daily or placebo (Clinicaltrials.gov: NCT03594110). The primary outcome (kidney disease progression or cardiovascular death) was assessed after median 2.0 years follow-up in post-hoc subgroups by baseline multimorbidity, concomitant medication count, and HRQoL (EuroQoL EQ-5D-5L) in thirds. Baseline frailty was estimated through a multivariable regression model predicting hospitalisation risk. Effects on the primary and safety outcomes were assessed by pre-specified Cox regression models.

Results: Empagliflozin lowered the relative risk of the primary outcome by 28% (hazard ratio 0.72, 95% CI 0.64–0.82) with no significant heterogeneity by frailty, multimorbidity, polypharmacy or HRQoL (all Het $P > 0.05$). Those in the highest categories of multimorbidity and polypharmacy, or with lowest HRQoL, had at least as much absolute benefit as those at the other extreme in each category, and across the frailty metric those with highest predicted hospitalisation risk had greatest estimated absolute benefit (trend P by frailty < 0.001). There was no evidence of a difference in effect

on safety outcomes by baseline frailty, multimorbidity, polypharmacy or HRQoL.

Conclusions: Absolute net benefits of empagliflozin in CKD are evident irrespective of baseline frailty, multimorbidity, polypharmacy and HRQoL, with potentially larger absolute benefits in those who are frail.

INCREASING CKD DETECTION IN HIGH RISK COHORTS THROUGH PRACTICE DATA REVIEW, EDUCATION AND IMPLEMENTATION OF A STRUCTURED PRACTICE FRAMEWORK: THE CKD CLINICAL AUDIT

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Biography:

Breonny is the General Manager, Clinical and Research at Kidney Health Australia. As part of the senior leadership team, she is responsible for leading the strategy, programs, and people across our clinical and research business, evidence-based content and messaging across the organisation, fostering key stakeholder relationships and partnerships.

Breonny has a Bachelor of Medical Science from Flinders University has worked in the health industry for over 20 years in roles spanning health leadership, program development, delivery and management, stakeholder relations, product sales, coaching and training.

She has worked for Kidney Health Australia for 14 years and is passionate about all things kidney health.

Aim: This clinical audit aimed to increase the detection and coding of CKD in high-risk cohorts in primary care through the use of practice data tools, education and implementation of a structured practice framework to drive practice change.

Background: 2 million people in Australia are living with CKD, although, reports show that 90% of them are unaware they have the condition.

Methods: Practices enrolled in the CKD clinical audit undertook data collection and analysis, CKD education, and review of associated practice systems contributing to CKD diagnosis gaps. The audit was targeted to people within practices with known CKD risk factors and no coded CKD diagnosis. Each participant reviewed their practice data 3 times across a 6-month period. Data gaps in CKD diagnosis were highlighted and benchmarked against local data and end point data. The findings were discussed and reviewed against deidentified data from other participating practices. GPs were given lists of people to review over the 6-month period.

Results: The audit involved 15 practices nationally with 86 participating GPs. and a combined practice population of 75 520 patients. At baseline, only 1530 patients had a coded diagnosis of CKD (2% of practice population) despite up to two thirds of the practice population having at least one CKD risk factor recorded.

Throughout the audit, 960 people were diagnosed with CKD resulting in a 124% increase in coded CKD cases. We also observed improved outcomes in key CKD management metrics, such as blood pressure and diabetes control and quality use of medicine.

Conclusion: Implementing a structured framework for detection and management of CKD leads to improvements in coded CKD diagnosis management metrics, clinician knowledge and practice systems.

ASSOCIATION OF DIABETES AND CHRONIC KIDNEY DISEASE IN YOUNG ABORIGINAL AND NON-ABORIGINAL ADULTS USING LARGE-SCALE LINKED COHORT DATA IN AUSTRALIA: THE ARDAC STUDY

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Aim: To describe the characteristics of young people aged (< 30 years old) having diabetes and the relationship with chronic kidney disease (CKD) using data from the Antecedents of Renal Disease in Aboriginal Children and Young Adults ("ARDAC") study.

Background: Over the past 20 years, the prevalence of diabetes has been increasing in young people, particularly among Aboriginal people.

Methods: Established in 2002, ARDAC has 14.5 years (SD 4.3) follow-up of young people (mean age at enrolment 11.1 years, SD 3.5), with linkage to 20 administrative datasets in 2023. Case definitions for diabetes (types 1 and 2) and CKD were developed based on biomedical measurements/self-reported cohort study data, ICD 9/10 codes from emergency department and admissions data, and diabetes indicators from perinatal, ambulance, primary health care and medicine use data. Descriptive statistics and bivariate analysis were used to describe the characteristics of participants with diabetes, using a 'strengths-based' analysis.

Results: From the 3743 participants (57.4% Aboriginal and 42.6% non-Aboriginal), around 12.9% (95% CI 11.8–14.0) of young people had a diabetes-related health service encounter since enrolment. This rate was higher among Aboriginal (16.1%) compared to non-Aboriginal (8.5%) participants (OR 1.90 95% CI 1.55–2.35). Among these people, 4.4% also had clinical CKD; this suggests these participants have diabetic nephropathy. When examined by date of first diabetes- and clinical CKD-related health service encounter, 71.4% had CKD before diabetes.

Conclusions: This study showed diabetes was high among young Australian adults, but disproportionately higher among Aboriginal people. Current understanding is diabetes is usually detected before CKD diagnosis; however, we demonstrate a larger proportion had CKD indicators prior to diabetes, highlighting the clinical disease pathway is more complex than previously understood.

DUAL INHIBITION OF COMPLEMENT C5A RECEPTOR 1 AND 2 IN DIABETIC KIDNEY DISEASE

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Aim: To ascertain if dual inhibition of C5aR1 and C5aR2 is renoprotective in a mouse model of diabetic kidney disease (DKD).

Background: Complement anaphylatoxin C5a is a potent inflammatory mediator. We have shown that inhibition of its receptor, C5aR1, either by genetic deletion or pharmacological inhibition is renoprotective in streptozotocin-induced diabetic mice. However, C5a also signals through a second receptor, C5aR2, with equal potency. The enigmatic C5aR2 is thought to be a nonsignalling decoy receptor for C5aR1, and its role in DKD is currently unclear. To ascertain the role of both receptors in DKD, we assessed renal function and injury in streptozotocin-induced diabetic C5aR1/C5aR2 double knockout (DKO) mice.

Methods: WT and DKO mice were treated with five daily injections of low dose streptozotocin (55 mg/kg) to induce diabetes and followed for 10 weeks. 24 h urine was collected for the measurement of albuminuria. Immune phenotyping was performed with spectral flow cytometry. Mitochondrial function was assessed by Seahorse bioanalyzer.

Results: Diabetes induced an increase in kidney weight, albuminuria, blood glucose, HbA1c, water intake and urine output ($P < 0.01$) in both WT and DKO mice. Interestingly, DKO mice displayed an overall reduction in mitochondrial oxygen consumption rate. However, mitochondrial maximal respiration capacity was increased in diabetic DKO mice when compared to nondiabetic DKO ($P < 0.01$), but this increase was not found in the WT kidney. Furthermore, anti-inflammatory FoxP3+ regulatory T cells were increased in nondiabetic DKO mice when compared to WT ($P < 0.05$) but not in the diabetic DKO group.

Conclusions: Overall, although the function of C5a receptors in DKD is still unclear, dual targeting of both C5a receptors suggest an immunomodulatory effect without affecting kidney function or glucose homeostasis.

HNRNPF OVEREXPRESSION EXTENSIVELY REGULATES EXPRESSION AND ALTERNATIVE SPLICING OF TARGET GENES ASSOCIATED WITH THE PROGRESSION OF DIABETIC KIDNEY DISEASE

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Aim: The purpose of this study was to explore the underlying mechanism of Heterogeneous Nuclear Ribonucleoprotein F (HNRNPF) in the progression of Diabetic kidney disease(DKD).

Background: DKD is the most important cause of end-stage renal disease and has become an urgent public health problem worldwide. HNRNPF is a member of a subfamily of widely expressed nuclear heterogeneous ribonucleoproteins with biological roles in regulating gene expression and variable splicing, and studies related to HNRNPF in DKD have been partially reported. However, the study of its potential mechanism in renal intrinsic cells has rarely been reported. Therefore, it is necessary to further investigate its mechanism in DKD, which will provide a novel idea to find new therapeutic targets for DKD.

Methods: In this study, HNRNPF was overexpressed in high glucose cultured human renal proximal tubular epithelial (HK-2) cells, while a normal control (NC) group was set up, using RNA-seq to obtain transcriptome data after HNRNPF overexpression in order to analyse the differential gene expression and variable splicing events affected by HNRNPF overexpression.

Results: In this study, RNA-seq was used to find that overexpression of HNRNPF in HK-2 cells cultured under high glucose condition caused significant downregulation of gene expression related to inflammatory response and inhibition of TNFα/NFκB signalling pathway, whereas it promoted a large number of variable splicing events of genes related to DKD.

Conclusions: HNRNPF acts as an RNA-binding protein that binds to mRNA and participates in the post-transcriptional regulation of target genes, and is able to regulate the expression and variable splicing of target genes. HNRNPF may play a role in DKD by modulating the expression and variable splicing of genes associated with DKD, especially genes associated with inflammatory response.

GENERAL NEPHROLOGY—EPIDEMIOLOGY AND PUBLIC HEALTH

VACCINE HESITANCY IN RENAL PATIENTS IN SOUTH-WESTERN SYDNEY

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Background: Vaccines are beneficial for patients with chronic kidney disease. However vaccine hesitancy may pose a challenge in optimising vaccination rates.

Aim: To understand views of renal patients in South-Western Sydney on COVID-19 vaccination.

Methods A multi-centre (SWSLHD) prospective cohort of prevalent haemodialysis, peritoneal dialysis and kidney transplant recipients (KTRs) who completed a validated survey on vaccination attitudes (VAX) between 16/6/2021 to 19/1/2022.

Results. 285 participants: 138 haemodialysis, 43 peritoneal dialysis and 104 KTRs. Median age was 60 years (Interquartile range 49–

67 years), 159 were male. Vaccination status: 35.1% vaccinated, 58.7% likely to get vaccinated and 6.4% hesitant.

These statements were agreed with: "I felt safe after vaccination" (86.6%), "I can rely on vaccines to stop serious COVID-19 disease" (86.2%), "although most vaccines appear to be safe, there may be problems we have not yet discovered" (88.7%) and "I worry about unknown effects of vaccines in the future" (65.8%). These were disagreed with: "vaccination programs are a big con" (82.4%), "authorities promote vaccination for financial gain, not for people's health" (74.2%), "natural immunity lasts longer than vaccination" (57.0%) and "natural exposure to viruses and germs gives the safest protection" (59.2%).

The dialysis population had a higher mean VAX score compared to KTRs, (3.69 vs. 3.44, $p = 0.011$). The dialysis population were more hesitant compared to KTRs in domains of: "concerns about commercial profiteering" (2.97 vs. 2.56, $p = 0.004$) and "preference for natural immunity" (3.2 vs. 2.81, $p = 0.008$). Both groups had VAX scores >4 for "worries about unforeseen future effects".

Conclusion: Participants supported the COVID-19 vaccination program, however remain concerned about unforeseen future effects of the vaccines. KTRs had lower VAX scores than dialysis patients.

THE ASSOCIATION BETWEEN URINE ALBUMIN AND ESTIMATED GLOMERULAR FILTRATION RATE WITH INCIDENT FRAILTY IN HEALTHY OLDER ADULTS: SECONDARY ANALYSIS OF THE ASPREE TRIAL COHORT

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Aim: To investigate whether abnormal kidney function is associated with incident frailty assessed by the modified Fried frailty phenotype (FP), and, separately, a deficit accumulation frailty index (FI).

Background: Identifying risk factors for frailty may facilitate early diagnosis and intervention to preserve functional status. The association between estimated glomerular filtration rate (eGFR) and albuminuria (spot urine albumin to creatinine ratio, UACR) with incident frailty in generally healthy older individuals is unclear.

Methods: This was a secondary analysis of 16 965 non-frail older adults aged ≥65 years in the ASPirin in Reducing Events in the Elderly (ASPREE) randomised trial cohort. Primary exposures were eGFR and UACR. Missing data in the FP was managed with multiple imputation. The primary outcome was time to incident frailty, analysed using multivariable adjusted discrete time survival analyses.

Results: The mean age was 75.0 ± 4.5 years, median eGFR 78.5 mL/min/1.73 m^2 (IQR 67.5, 89.3), and the median UACR was 0.80 mg/mmol (IQR 0.50, 1.50). In analyses using the FP, 950 people developed frailty over a median follow-up of 4.7 years (IQR 3.0, 5.0). Using the FI, 2338 developed frailty over a median of 4.0 years (IQR 3.0, 5.0). The relationships between eGFR and both incident FP and FI was non-linear, such that an eGFR <45 or ≥75 mL/min/1.73 m^2 was significantly associated with an increased risk of incident frailty. For every doubling of baseline UACR, risk of incident frailty increased by 4% using the FP (HR: 1.04, 95% CI:1.02–1.07) and the FI (HR: 1.04, 95% CI:1.01–1.07).

Conclusions: In older adults, doubling of UACR, even at very low levels, was independently associated with incident frailty. Both low and high eGFR were associated with increased risk of incident frailty.

IMPACT OF THE CKD-EPI 2021 EQUATION ON THE CLASSIFICATION OF CKD IN OLDER AUSTRALIAN ADULTS

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Aim: To investigate the clinical impact of transitioning from the 2009 CKD-EPI (CKD-EPI$_{2009}$) to the 2021 CKD-EPI (CKD-EPI$_{2021}$) estimated glomerular filtration rate (eGFR) equation in generally healthy older Australians.

Background: A recalibrated version of CKD-EPI$_{2009}$, without a race coefficient, was released in 2021 (CKD-EPI$_{2021}$). This updated equation, implemented in the US, can result in the reclassification of chronic kidney disease (CKD) stage in a significant proportion of individuals.

Methods: This was a prospective cohort study using data from 16 244 Australian community-dwelling adults aged ≥70 years, in the ASPirin in Reducing events in the Elderly (ASPREE) study cohort. Baseline characteristics and long-term health outcomes were compared in participants who were reclassified to a different chronic kidney disease (CKD) stage with CKD-EPI$_{2021}$ versus those with unchanged classification.

Results: With CKD-EPI$_{2021}$, baseline eGFR increased by a median of 3.8 mL/min/1.73 m^2 (interquartile range [IQR] 3.3, 4.4) resulting in the reclassification of 3274 (20%) participants to a less advanced CKD stage and the reduction in the prevalence of CKD from 17% to 12%. Over a median follow-up period of 6.4 years (IQR 5.4, 7.6), there was no difference in disability-free survival (HR: 0.94, 95% CI:0.84–1.05), mortality (HR: 0.89, 95% CI:0.78–1.03), major cardiac events (HR: 0.94, 95% CI:0.79–1.13), or hospitalisations for heart failure (HR: 1.00, 95% CI:0.67–1.49) in reclassified, versus non-reclassified, participants.

Conclusions: Implementing CKD-EPI$_{2021}$ would raise eGFR by a median of nearly 4 mL/min/1.73 m^2, substantially reducing the proportion of older Australian adults classified as having CKD with no difference in long-term health outcomes among reclassified people. Transitioning to using the CKD-EPI$_{2021}$ may result in a significant reduction in nephrology referrals in generally healthy, older adults.

IDENTIFYING THE KIDNEY HEALTH COMMUNITIES' PRIORITIES FOR UPDATED EVIDENCE-BASED GUIDANCE

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Aim: to identify the currency of research questions in existing chronic kidney disease (CKD) systematic reviews and guidelines and determine the kidney communities research priorities to maximise resources and improve CKD care.

Background: Scientific research has rapidly proliferated, and the priorities of the community don't always match this growth, leaving outdated, low-utility clinical guidelines and systematic reviews, leading to sub-optimal care. Improving our understanding of the kidney health communities' preferences will ensure high priority evidence-based guidance to inform clinical care of CKD.

Methods: We categorised clinical questions covered in CKD guidelines and Cochrane systematic reviews by stage (pre-dialysis, haemodialysis, peritoneal dialysis, transplantation) to inform a multistakeholder, multi-round Delphi survey. Health professionals and consumers were invited via professional networks and consumer bodies to rank the importance of research questions using 9-point Likert and Best-Worst scales. We analysed the data using descriptive statistics, regression analysis, and thematic analysis.

Results: We linked 178 relevant Cochrane reviews to 79 Guidelines with over 50% of guidelines >5 years old. 107 participants completed the survey. Overall >80% of topics were ranked higher by consumers (30% of the participants). We identified 20 high priority clinical questions (>7.5 mean Likert ranking), the highest were evaluation and management in CKD; peritoneal dialysis infection and peritonitis; haemodialysis symptom management; and transplant rejection.

Conclusions: Most current CKD guidelines are outdated. The communities' priorities don't always align with the latest guidance, reflected by prioritised research questions in areas that have updated guidance for pre-dialysis and peritoneal dialysis, suggesting improved guideline implementation alongside prioritisation. By incorporating both consumer and healthcare professional perspectives, this research ensures limited resources target the most pressing questions in CKD management to improve care.

LONG TERM RISK OF KIDNEY FAILURE FOLLOWING CARDIAC SURGERY: A NATIONAL DATA LINKAGE STUDY

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Aim: To estimate the long term risk of kidney failure treated by kidney replacement therapy (KRT) following cardiac surgery and describe associations with pre-operative kidney function, diabetes and post-operative acute kidney injury (AKI).

Background: Post-operative AKI is a common complication of cardiac surgery and may lead to the commencement of KRT, however risk has not been estimated at a national level for surgeries in Australia.

Methods: Data were linked probabilistically between the Australia & New Zealand Dialysis & Transplant Registry and the Australian & New Zealand Society of Cardiac & Thoracic Surgeons Cardiac Surgery Database. Risk of KRT following cardiac surgery was compared among cohorts defined by pre-operative kidney function using estimated glomerular filtration rate (eGFR), pre-operative diabetes and post-operative AKI using time-to-event analysis. Surgeries for all adults (except those already receiving KRT) from 2001 to 2019 were included ($n = 149\,006$), with follow-up until end of 2019.

Results: A total of 1254 (0.84%) adults commenced KRT at any point during follow-up. The median follow-up time was 5.8 years (interquartile range 2.7, 9.8). Incidence of KRT at 10 years post-surgery was 1.2% (95% CI 1.1, 1.3). Ten-year incidence increased with decreasing pre-operative eGFR from 1.7% (1.6,1.9) (eGFR 30 to 59 mL/min/1.73 m2) to 16% (15, 18) (eGFR <30 mL/min/1.73 m2), compared to 0.36% (0.32, 0.42) for patients with normal function to mildly reduced eGFR (≥ 60 mL/min/1.73 m2). Higher incidence at 10 years was found for cohorts with pre-operative diabetes (5.8% [5.2,6.4]) or with post-operative AKI (4.6% [4.0, 5.3]) compared to those without diabetes (0.50% [0.48,0.59]) or without AKI (1.0% [0.93, 1.1]) respectively.

Conclusions: Adults with poorer pre-operative kidney function, with pre-operative diabetes or with post-operative AKI experienced the highest 10-year incidence of KRT following cardiac surgery.

OPTIMISING PRIMARY CARE REFERRALS TO NEPHROLOGY SERVICES BASED ON RISK STRATIFICATION (KFRE)

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Aim: To evaluate the utility of the kidney failure risk equation (KFRE) tool on referral patterns in a cohort of chronic kidney disease (CKD) from a single centre enrolled in Queensland CKD Registry (CKD.QLD).

Background: The KFRE is the most widely used and validated risk prediction tool in CKD population across the globe. However, its utility in optimisation of specialist referrals requires evaluation.

Methods: We conducted a retrospective study of adult participants (≥ 18 years) with stage 3–5 CKD (eGFR between 10 and 60 mL/min/1.73 m^2) who were enrolled into the CKD.QLD Registry from a nephrology service in a referral hospital. Variables accessible in the Registry database were integrated into the non-North American 4-variable KFRE to study the utility of this equation on referral patterns to specialist nephrology care.

Results: A total of 1175 participants met the inclusion criteria, of which 467 (39.8%) fulfilled the Kidney Health Australia (KHA)'s eGFR threshold of <30 mL/min for referral. Of the 708 (60.26%) who did not fulfil the KHA criteria, 330 (46.61%) were deemed to be at high risk of progressing to kidney replacement therapy (KRT) based on 5-year KFRE threshold of 3% for referral, whereas 394 (33.53%) had a low 5-year risk of <3% for progression. In the high-risk group, 106 (14%) progressed to KRT in contrast to only 3 (0.76%) in low-risk group.

Conclusion: KFRE has utility in predicting high risk of progression even in those who do not meet the KHA threshold for referral, while identifying those who are at low risk for progression, who could be managed in primary care. Hence, application of KFRE can optimise specialist referral, for better utilisation of healthcare resources.

A BROAD EPIDEMIOLOGICAL DESCRIPTION OF DIALYSIS PRACTICE CHANGES DURING THE COVID-19 PANDEMIC IN AUSTRALIA AND NEW ZEALAND

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Aim: To assess the impact of the COVID-19 pandemic on dialysis starts in Australia and New Zealand.

Background: The broader effects of COVID-19 on dialysis practice have had limited attention. Australia and New Zealand experienced varying degrees of public health orders which may have influenced health care delivery.

Method: A retrospective cohort of incident adult dialysis patients, between 1/1/2018 and 31/12/2022 in the ANZDATA Registry were

included, using patients commencing in 2018–2019 as pre pandemic controls. The primary outcome was the rate of incident dialysis patients. Pre and pandemic start rates and predictors by dialysis modality, demographics and lockdown effects was compared using multivariate generalised linear mixed models. The COVID-era was treated as the exposure. Starting dialysis during a lockdown was treated as a separate exposure for the years 2020–2021.

Results: 11690 patients commenced dialysis between 2020 and 2022, with no significant difference in incident start rate compared to 2018–2019 (IRR = 1.02, $p = 0.063$). The uptake of any home-based therapy was higher in 2020 (OR = 1.16, $p = 0.002$), but not in 2021 and 2022. Peritoneal dialysis (PD) uptake was higher in 2020 (OR = 1.14, $p = 0.005$) and 2021 (OR = 1.10, $p = 0.037$) with no difference in 2022 (OR = 0.95, $p = 0.284$). There was no effect of lockdowns on starting modality (PD vs. HD, $p = 0.993$) or home vs facility treatment ($p = 0.797$).

Haemodialysis patients were less likely to start with an arteriovenous fistula (AVF) or graft (AVG) in 2022, compared to 2018–2019 (OR = 0.870, $p = 0.005$). Patients starting during lockdown were also less likely to start with an AVF/AVG (OR = 0.787, $p = 0.014$).

Conclusion: There was no significant impact on the incident rate of dialysis patients between 2020–2022, although there were some differences in home dialysis uptake and starting access type.

QUALITY ASSESSMENT OF SHORT VIDEOS ABOUT CHRONIC KIDNEY DISEASE ON SOCIAL MEDIA PLATFORMS—A CROSS-SECTIONAL STUDY

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Aim: To assess the quality of information currently available about chronic kidney disease (CKD) management through short video format on popular social media platforms.

Background: Social media platforms can disseminate misinformation, with audience engagement often prioritised over information quality. With a rising prevalence of CKD, it is important to evaluate the reliability and quality of information aimed at educating the community about disease management.

Methods: Using a cross-sectional design, this study evaluated the first 100 short format videos on Instagram and TikTok retrieved by the search phrase "chronic kidney disease". Videos were analysed by 2 reviewers for alignment with KDIGO guidelines, information quality using the DISCERN instrument, and whether the author claimed to be a health care professional (HCP).

Results: Of the retrieved Instagram videos, 68/100 (68%) were relevant. 24/68 (35%) videos described guideline-aligned management and 5/68 (7%) videos provided a reference for their information. 22/68 (32%) videos were authored by a HCP, of which 10/22 (45%) met KDIGO guidelines. 67/68 (99%) videos were of low quality.

Of the retrieved TikTok videos, 94/100 (94%) were relevant. 43/94 (46%) videos described guideline-aligned management and 4/94 (4%) videos provided a reference. 24/94 (26%) videos were authored by a HCP, of which 13/24 (54%) met KDIGO guidelines. 90/94 (96%) videos were of low quality.

Conclusions: Overall, information related to CKD management through short video format on Instagram and TikTok is of low quality and reliability. Thus, it is not an appropriate patient education tool. While increased HCP presence has been suggested to tackle misinformation, most videos by HCP also presented non-guideline aligned management.

GENERAL NEPHROLOGY—GLOMERULONEPHRITIS

PATIENT'S PERSPECTIVES ON LIVING WITH PRIMARY MEMBRANOUS NEPHROPATHY: A SEMI-STRUCTURED INTERVIEW STUDY

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Aim: To describe patient experiences of living with membranous nephropathy (MN).

Background: A third of patients with MN develop kidney failure if untreated but treatment decisions can be challenging due to differences in treatment administration, onset of action and toxicities. There is limited evidence about patient perspectives on MN and its treatments.

Methods: Semi-structured interviews were conducted with 20 participants with MN from five hospitals in Sydney. Transcripts were analysed thematically.

Results: Participants had a mean age of 63 years, were mostly men (85%), white (65%), with relapsing disease (50%, averaging 1.8 relapses over the past 5 years) and chronic kidney disease stages 1–2 (45%), Stage 3 (25%), stages 4–5 (10%), or receiving kidney replacement therapy (20%). Five themes were identified: impeding life participation (subthemes of invisibility of exhaustion, debilitated by swelling, restricted activity from treatment); straining relationships (fracturing family life and friendships, guilt of burdening others, guilt of losing a transplant from recurrent disease); overwhelmed with treatment decision-making (disempowered by inadequate information, disorientated by an unfamiliar disease, trusting and deferring to clinical expertise); disheartened and disappointed with treatment (confronting

unexpected treatment harms, frustration and fear of catastrophic complications, demoralised by the incurability of disease, resigned to treatment toxicity); and uncertain future and health (unable to plan ahead, insecurity from lack of tangible treatment benefit).

Conclusions: Participants with MN live with a chronic relapsing disease, fatigue, swelling and substantial treatment harms that impact life participation and relationships. There is a need for implementation research on interventions to ameliorate this burden by providing support and education about their disease, engaging in shared dialogue about treatments, their potential side-effects and setting realistic expectations of treatment benefits.

BAFF-EXPRESSING CHIMERIC ANTIGEN RECEPTOR T-CELLS SPECIFICALLY ELIMINATE B-CELLS IN-VITRO

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Aim: To develop a chimeric antigen receptor (CAR) T-cell that genetically expresses B-cell activating factor (BAFF) to specifically target B-cells.

Background: BAFF is a B-cell growth factor that is involved in the development of autoreactive B-cells by protecting against cell death. Serum concentrations of BAFF are associated with disease activity in autoimmune glomerulonephritis including lupus nephritis, IgA nephropathy and membranous nephropathy. BAFF CAR T-cells may redirect T-cell killing towards autoreactive B-cells that require high BAFF levels for survival.

Methods: We generated two BAFF CAR constructs (full-length and truncated BAFF) consisting of the extracellular domain of human BAFF and generated BAFF CAR-T cells using a PiggyBac transposon, a non-viral gene delivery method. Cytotoxicity against Raji B-cells was evaluated using the Calcein assay. Intracellular cytokine release, memory phenotype and exhaustion phenotype were assessed on flow cytometry.

Results: Both full-length and truncated BAFF CAR T-cells demonstrated increased cytotoxicity against Raji B-cells compared to unmodified T-cells. Co-culture of both full-length and truncated BAFF CAR T-cells with Raji B-cells resulted in induction of the degranulation marker CD107a and proinflammatory cytokines (interferon (IFN)-γ and interleukin (IL)-2), compared to unmodified T-cells co-cultured with Raji-B cells. BAFF CAR-T cells exhibited a central memory T-cell (CD62L + CD45RA-) phenotype without increased expression of markers of T-cell exhaustion (programmed death (PD)-1, T cell immunoglobulin and mucin domain-containing protein (Tim)-3, lymphocyte activation gene (LAG)-3).

Conclusions: BAFF T-cells eliminate B-cells in-vitro and may represent a novel treatment for B-cell mediated autoimmunity, which underpins many forms of glomerulonephritis.

THERAPEUTIC DRUG MONITORING OF MYCOPHENOLATE MOFETIL USING A LIMITED SAMPLING STRATEGY IN PATIENTS WITH LUPUS NEPHRITIS: AN AUSTRALIAN SINGLE CENTRE EXPERIENCE

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Aim: To examine the role of mycophenolic acid area-under the curve (MPA-AUC) in guiding mycophenolate mofetil (MMF) dosing, and assess associations with adverse effects and infection rates in patients with lupus nephritis (LN).

Background: The backbone of LN treatment is mycophenolic acid analogues (MPAA) such as MMF. Its active metabolite, MPA, displays large inter-patient variability but there is limited data as to whether therapeutic drug monitoring (TDM) improves the balance between achieving LN remission and managing toxicity.

Methods: A retrospective cohort study was conducted at The Royal Melbourne Hospital. Demographics, immunosuppression, biochemical data, adverse events and infective complications were collected over a 12-month period. Estimated MPA-AUC (0–12 h) was calculated using trapezoid method. Pearsons correlation coefficient was utilised to explore correlations between estimated MPA-AUC (0–12 h) and outcome variables.

Results: Nineteen estimated MPA-AUC (0–12 h) measurements were collected across 16 patients with LN ($n = 13$) and other glomerular diseases ($n = 3$). Median MPA-AUC (0–12 h) was 39.6 (IQR 29.8–44.5) mg·hr/L with 4 (21.1%) patients being subtherapeutic and 2 (10.5%) supratherapeutic requiring dose adjustment to maintain a therapeutic range of 30–60 mg·hr/L. Weight-based dosing was 34.5 (IQR 20.9–40) mg/kg and was significantly associated with estimated MPA-AUC(0–12 h) ($p = 0.0364$) whereas weight itself was not ($p = 0.3473$). Higher estimated MPA-AUC (0–12 h) did not correlate with number of adverse effects or infective complications.

Conclusion: Our data is representative of a real-world, single centre experience and demonstrates that TDM can be used to guide dosing of MMF in a glomerulonephritis setting. Weight-based MMF dosing was significantly associated with MPA-AUC (0–12 h) and our results suggest that a fixed dosing strategy may not be

appropriate for all patients with LN. Larger prospective studies are required to establish correlation between MPA-AUC, renal response and risk of toxicity.

CLINICAL FACTORS INFLUENCING CORTICOSTEROID INITIATION PRIOR TO KIDNEY BIOPSY IN GLOMERULONEPHRITIS

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Background: Delaying treatment of glomerulonephritis may result in irreversible kidney damage. However, the decision to initiate corticosteroids prior to a kidney biopsy may vary according to the clinical situation.
Aim: To assess factors that influence a physician's decision in initiating corticosteroids prior to biopsy.
Methods: Kidney biopsies performed from June 1, 2020 to December 31, 2022 for suspected glomerulonephritis were included. Patients with corticosteroids initiated prior to biopsy were compared to patients who were not. Categorical variables were compared using chi-squared tests, and medians were compared using Mann–Whitney *U* tests.
Results: Of 154 patients, 37 (24.0%) received corticosteroids prior to biopsy, although 10 were on chronic steroid therapy. An autoimmune disease history ($p = 0.001$), lower serum albumin ($p = 0.003$), and haematuria ($p = 0.028$) were associated with steroid initiation, while chronic kidney disease ($p = 0.02$) and hypertension ($p = 0.048$) were lower among these patients. There was no association with renal function or proteinuria at presentation. Subgroup analysis of patients who received pulsed methylprednisolone prior to biopsy found these patients also had a higher urea ($p < 0.001$) and lower eGFR ($p = 0.003$).
Glomerulonephritis was identified in 87 biopsies (56.5%), which was higher among patients who received corticosteroids prior to biopsy (81.5% vs.51.2%, $p = 0.004$). In these patients, the cumulative corticosteroid dose, number of corticosteroid days, use of methylprednisolone, and use of other immunosuppressants were not associated with finding glomerulonephritis on biopsy. When comparing patients who received corticosteroids prior to biopsy to those who only received corticosteroids afterwards, there was no difference in various clinical outcomes at 12 months including change in renal function.
Conclusions: Various factors may lead to corticosteroid initiation prior to kidney biopsy, and such patients are likely to have glomerulonephritis identified on biopsy.

BILATERAL SEROUS RETINAL DETACHMENT AS A PRESENTING SIGN OF MEMBRANOUS NEPHROPATHY—A CASE REPORT

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Background: The aim of this report is to present a rare case of bilateral serous retinal detachment (SRD) as a presenting sign of nephrotic syndrome.
Case Report: A 68-year-old man with no known kidney disease presented with sudden-onset bilateral visual blurring and new nephrotic syndrome, characterised by generalised oedema, hypoalbuminaemia (16 g/L), and nephrotic-range proteinuria (PCR 1200 g/mol). He had a concurrent acute kidney injury requiring dialysis due to hyperkalaemia (6.3 mmol/L), uraemia (53.2 mmol/L) and refractory fluid overload. Computed Tomography imaging revealed non-obstructing calculi in both kidneys. Initial serology revealed positive ANA (1:640 speckled), SSA and SSB, and depressed C3 (0.65 g/L). Optical coherence tomography scans revealed bilateral SRD secondary to nephrotic syndrome.
The patient proceeded to a kidney biopsy which showed mild glomerular ischaemia only. Glucocorticoids were empirically commenced for presumed minimal change disease, awaiting electron microscopy results. Over the next 6 weeks, there was improvement in visual acuity, kidney function (Cr 159 µmol/L) and proteinuria (PCR 174 g/mol). Electron microscopy demonstrated diffuse podocyte effacement and subepithelial and intramembranous deposits, consistent with membranous nephropathy. Serum PLA2R antibodies were not detected. Two months later, the patient had worsening SRD coinciding with worsening proteinuria (PCR 752 g/mol). A repeat kidney biopsy showed PLA2R-negative membranous glomerulonephritis with crescents and positive IgG1 and IgG3 segmental granular staining in capillary loops on immunofluorescence.
The provisional diagnosis was membranous nephropathy secondary to Sjogren's syndrome. The patient is planned for treatment with the modified Ponticelli regimen.
Conclusions: Bilateral SRD is a rare presenting sign for nephrotic syndrome and a potential marker of response to therapy. Prompt recognition and management of the underlying nephrotic syndrome are essential for restoration of visual function and prevention of long-term complications.

OUTCOMES IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS AND PROTEINURIA: A MULTI CENTRE COHORT STUDY

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Aim: To assess outcomes in systemic lupus erythematosus (SLE) patients with proteinuria.

Background: Proteinuria greater than 0.5 g/24 h has a high positive predictive value for lupus nephritis (LN) and the degree of proteinuria is essential for assessment of treatment response and prognostication.

Methods: Longitudinal data from a 13-country SLE cohort, collected between 2013 and 2020, were analysed. This study compared patient characteristics, medication use and outcomes of SLE patients with or without proteinuria, defined as urine protein-to-creatinine ratio (UPCR) > 0.5 g/24 h or >0.05 g/mmol, as per the SLE disease activity index (SLEDAI) proteinuria criterion.

Results: In total, 4106 patients (92% female sex, 89% of Asian ethnicity), followed over a median of 2.5 years [IQR: 1.0, 5.1], were studied. Of these, 33% ($n = 1371$) had proteinuria at least once during the study period (proteinuria-ever group). Compared with the proteinuria-never group, patients in the proteinuria-ever group were younger at enrolment (41 [IQR: 31.0, 52.0] vs. 37 [IQR:28.0, 47.0] years, $p < 0.001$) and diagnosis (30 [IQR: 22.0, 40.0] vs 27 [IQR: 20.0, 36.0] years, $p < 0.001$); had increased disease activity, including flares (40% vs 79%, $p < 0.001$); higher glucocorticoid exposure (time-adjusted mean prednisolone dose (4.6 [IQR: 0.9, 7.4] vs 7.4 [IQR: 5.0, 10.8] mg/day, $p < 0.001$)), and had more organ damage accrual (15% vs 29%, $p < 0.001$). At the end of the study period, a significantly higher proportion of patients in the proteinuria-ever group had eGFR<30 mL/min/1.73 m2 (8.5% vs 2.3%, $p < 0.001$) and were deceased (3.9% vs 1.4%, $p < 0.001$). Significantly fewer patients in the proteinuria-ever group attained lupus low disease activity state at least once during the study period (67% vs. 85%, $p < 0.001$).

Conclusions: SLE patients with proteinuria had significantly poorer long-term outcomes than those without.

PERFORMANCE OF ANCA KIDNEY RISK SCORE FOR PREDICTING RENAL OUTCOME IN A NEW ZEALAND COHORT

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Aim: To assess performance of the ANCA Kidney Risk Score (AKRiS) in predicting risk of end-stage kidney disease (ESKD) in a New Zealand cohort with glomerulonephritis (GN) secondary to ANCA-associated vasculitis (AAV).

Background: There is emerging evidence for the AKRiS as a simple and effective measure to predict risk of ESKD in AAV GN. Utilisation of this tool may assist clinicians in identifying patients with higher risk of morbidity associated with diagnosis, and tailoring treatment accordingly. To date, the utility of the AKRiS has not been evaluated in a New Zealand cohort.

Methods: Using a biopsy database, cases of pauci-immune glomerulonephritis in the three Auckland Districts between 01/01/2008 and 31/12/2018 were identified and histopathological data extracted.

Hospital electronic records were manually screened to extract relevant clinical information.

Results: There were 149 patients included in the cohort. The majority of patients (80, 53.69%) had >25% normal glomeruli at diagnosis, and low interstitial fibrosis/tubular atrophy (107, 72%). Mean estimated glomerular filtration rate at diagnosis was 27.7 mL/min. 32 patients (21%) developed ESKD with a median follow-up time of 7 years. Of 121 patients with sufficient data for AKRiS score calculation, 68 (56%) were classified as low risk, 27 (22%) as moderate risk, 20 (17%) as high risk, and 6 (5%) as very high risk. Unadjusted log rank test demonstrated a statistically significant difference between the AKRiS groups in terms of risk of ESKD ($p < 0.01$), as well as mortality ($p < 0.01$).

Conclusion: In a cohort of New Zealand AAV GN patients, the AKRiS performed well in discriminating risk of ESKD as well as mortality.

ANCA-ASSOCIATED VASCULITIS WITH RENAL INVOLVEMENT IN THE AUCKLAND REGION

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Aim: To describe a cohort of patients with anti-neutrophil cytoplasmic antibody-associated vasculitis (AAV) with renal involvement in the Auckland region.

Background: Glomerulonephritis secondary to AAV carries significant risk of end-stage kidney disease (ESKD) and mortality. There is also considerable morbidity associated with conventional treatments. Limited contemporary literature exists on clinical features, treatment and long-term outcomes of AAV in New Zealand.

Methods: Cases of biopsy-proven pauci-immune glomerulonephritis in the three Auckland Districts between 01/01/2008 and 31/12/2018 were identified. Hospital electronic records were manually screened to extract relevant demographic, treatment, and clinical outcomes.

Results: Of 149 patients in the cohort, the majority were male (86, 58%), and of European ethnicity (104, 70%). There were 9 Maori (6%) and 11 Pasifika (7%) patients. Mean age at diagnosis was 64.2 years. MPO-ANCA positivity was 58% and PR3-ANCA positivity was 34%. The mean peak creatinine at initial presentation was 354 µmol/L. The majority of patients received cyclophosphamide induction (121, 81%) and azathioprine maintenance (85, 57%). In a median follow-up time of 7 years, 32 patients (21%) developed end-stage renal failure, and 66 patients (44%) died. Unadjusted log-rank test demonstrated no statistically significant difference in survival on basis of ethnicity ($p = 0.14$). Severe infection was observed in 84 (56.4%) of patients, cardiovascular events in 39 (26%) and malignancy in 36 (24%).

Conclusion: This is the largest descriptive cohort study in New Zealand to date of AAV with renal involvement. Due to funding restrictions on rituximab, there is a high rate of cyclophosphamide use. This study also demonstrates ongoing high rates of ESKD, severe infections, and mortality in a contemporary cohort.

GLOMERULAR MONOCLONAL GAMMOPATHIES IN WESTERN AUSTRALIA, STATE-WIDE 5-YEAR RETROSPECTIVE ANALYSIS

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Background: Monoclonal gammopathies of renal significance (MGRS) have emerged as an important cause of kidney injury. MGRS needs careful attention because without prompt diagnosis and timely intervention, the patients have significantly high risk of progression to haematological malignancies and/or end-stage kidney disease (ESKD).

Aim: The study aimed to evaluate the renal and haematological outcomes of patients with glomerular monoclonal gammopathies in Western Australia.

Methods: All patients with glomerular pathologies secondary to monoclonal gammopathies identified retrospectively in native renal biopsies evaluated at the state-wide renal pathology units, PathWest Laboratory Medicine, from 01.01.2019 to 31.12.2023. Inclusion: All patients that fulfilled the diagnostic criteria for glomerular MGRS. Exclusion: Non-glomerular MGRS, lack of tissue for immunofluorescence, and presence of concurrent diagnosis that could affect the outcome.

Results: We identified 45 patients with glomerular monoclonal gammopathies, with mean age of 66 years (SD12), and 28 (62%) being male. The cohort included 25 patients (56%) with AL amyloidosis, 9 patients (20%) with Proliferative Glomerulonephritis with Monoclonal Immunoglobulin Deposition (PGNMID), 6 patients (13%) with Monoclonal Immunoglobulin Deposition Disease (MIDD), and 3 patients (6%) with Cryoglobulinaemic Glomerulonephritis.

With a median follow up of 43.5 months, 8 patients (18%) progressed to ESKD. All-cause mortality was 27% (12 patients). Median eGFR at time of diagnosis was 55 (IQR 53) mL/min/1.73 m2 with median of 39 (IQR 31) mL/min/1.73 m^2 at 12-months. Bortezomib based therapy was the commonest therapy (49%), followed by autologous stem cell transplant (22%). Daratumumab based therapy was used in 20% of the patients.

Conclusion: MGRS is A significant cause of ESKD. However, prevalence is likely underestimated given the infrequency of renal biopsy in patients with monoclonal gammopathies. Further research is needed regarding early screening for MGRS.

GENERAL NEPHROLOGY—HEALTH SERVICES RESEARCH

DOES ROUTINE EGFR REPORTING ADVERSELY AFFECT MEDICATION DOSING IN THE ELDERLY?

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Aim: To identify if drug dosing errors occur in patients age ≥ 65 based on usual reporting of estimated glomerular filtration rate (eGFR) compared with reporting by the Cockcroft-Gault (CG) equation.

Background: Creatinine-based GFR equations are commonly used in clinical practice to guide drug dosing. The Australian Therapeutic Guidelines recommend use of the CG derived eGFR as the basis for drug dosing guidelines (Therapeutic Guidelines, 2019. Estimating glomerular filtration rate in adults). However, the standard reporting of eGFR within Australian hospitals and laboratories is via the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI 2021) equation.

Methods: We studied a single-centre prospective cohort of aged care patients, age ≥ 65-years-old, admitted under the Geriatrics Team at Port Macquarie Base Hospital, Australia, over 3 months. 163 patients were included, with 8 excluded as weights were not recorded in the year prior. Creatinine was calculated on admission and in the 48 hours prior to discharge and the average of these two results used to calculate eGFR using CG and CKD-EPI 2021.

Results: Of the 208 medications prescribed that required adjustment based on renal function, there were 38 (18%) dosing errors. The most common drugs in question were perindopril, apixaban and ciprofloxacin. Twenty-nine (76%) of these errors occurred regardless of which eGFR calculation was used. The other nine (24%) dosing errors (7 over-dosed and 2 under-dosed) occurred if using CKD-EPI 2021 rather than CG.

Conclusions: Minimal differences occur in drug dosing when using CG and CKD-EPI 2021 formulas. However, when discrepancies occur, use of CKD-EPI 2021 typically results in medication overdoses, which could result in adverse reactions in an at-risk population.

THE USE OF TELEHEALTH IN MANAGING PATIENTS WITH CHRONIC KIDNEY DISEASE: THOUGHTS AND PERSPECTIVES OF NEPHROLOGISTS

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Aim: To describe the experience and perspectives of nephologists on caring for patients with chronic kidney disease (CKD) using telehealth.

Background: During the COVID-19 pandemic, many nephrology clinics had to adapt to a telehealth mode of care to manage their patients to limit the risk of COVID-19 exposure.

Methods: Semi-structured face-to-face interviews were conducted with 37 nephrologists from 23 centres across Australia and New Zealand. Interviews were recorded, transcribed, and analysed qualitatively.

Results: We identified five major themes: enhancing patient-centred care (convenient for patients, enabling self-management, reducing exposure to risk, improving follow up, and alleviating financial burden in accessing care); protecting personal connection and trust (requires established rapport with patients, hampering honest conversations, reduced attentiveness, and missed opportunity to connect with patient); diminished ability to provide quality care (cannot physically examine patient, limited ability to assess incidentals, appropriate renumeration and loss of mentoring younger doctors); navigating technical challenges (interrupted communication, new and daunting technologies, and cognizant of patient digital literacy), fostering innovative delivery of care (improved access to care, ease of multidisciplinary discussions and expanding use of telehealth).

Conclusion: Telehealth minimises overall treatment burden but cannot be used as a sole method of treating patients. Telehealth is a valuable tool in facilitating health care access and to provide high quality care improvements in internet connectivity, logistics and appropriate renumeration for appointments is required.

ABORIGINAL KIDNEY CARE TOGETHER -IMPROVING OUTCOMES NOW (AKCTION): PROCESSES, REALITIES AND BENEFITS OF FIRST NATIONS LED RESEARCH

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Aim: To share the research approach and learning that is transforming experiences and outcomes of kidney care with and for First Nations Peoples in South Australia.

Background: First Nations Peoples strength, resilience, expertise and Governance is central to reducing the impact of kidney disease, but opportunities for meaningful involvement are rare. First Nations Kidney Warriors, kidney health professionals and researchers initiated the AKction project responding to lived experiences in urban, rural, and remote locations.

Methods: First Nations knowledge systems and Decolonising Methodologies inform new opportunities, understanding and responses. Indigenous Governance is strengthened through First Nations Kidney Warriors positioned as chief investigators and reference team members. Participatory Action Research involving Yarning, Ganma

and Dadirri reinforces First Nations ways of knowing, being and doing, centtring the voices, experiences and priorities of First Nations communities. Healthcare professionals, managers and program leaders are positioned as allies/accomplices with vital knowledge of kidney disease, treatment options and the way the health system operates.

Results: Kidney Warriors voices and expertise are elevated by working in deep-collaboration with researchers, clinicians, educators and health-care services, rather than viewed as passive recipients of healthcare and research. Healthcare professionals' and services willingness to critically reflect and decolonise their practice genuinely reduce power imbalances and improves cultural safety within kidney care. This has led to improved communication, coordination and collaboration resulting in new models of care that respond to community priorities and concerns, such as dialysis within an Aboriginal hostel.

Conclusions: Establishing meaningful Indigenous Governance and respectful collaborations between culturally diverse groups leads to improved care experiences and outcomes, whilst also challenging inherent power imbalances in healthcare and research.

GENERAL NEPHROLOGY—OTHER

A SYSTEMATIC REVIEW OF THE COMPARATIVE PROGNOSTIC ACCURACY OF AGE-SPECIFIC ESTIMATED GLOMERULAR FILTRATION RATE EQUATIONS IN OLDER ADULTS

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Aim: Systematic review of age-specific estimated glomerular filtration rate (eGFR) equations in comparison to the Chronic Kidney Disease Epidemiological Collaboration (CKD-EPI) equation in predicting mortality, cardiovascular outcomes, and hospitalisations in community-dwelling older adults aged ≥65 years.

Background: Age-specific eGFR equations, including the Berlin Initiative Study-1 (BIS1) and Berlin Initiative Study-2 (BIS2), were developed for older populations. Understanding the role of age-specific eGFR equations in prognosticating long-term health outcomes in older adults may inform patient-centred care, and prioritisation of patient goals.

Methods: A search was conducted in EMBASE, MEDLINE and Scopus. Risk of bias was assessed using the quality in prognostic factor studies (QUIPS) tool. Meta-analysis was undertaken using common effect and random effects based on log hazard ratios and their standard errors. The inverse variance method was used for pooling.

Results: Eleven studies met inclusion criteria (n = 20 681). The pooled mean age was 81 years (IQR: 76, 86), and baseline eGFR (CKD-EPI) was 67 mL/min/1.73 m2 (IQR: 61, 72). Three studies carried high risk of bias. Ten studies examined all-cause mortality, 1 assessed cardiovascular events, and 2 assessed hospitalisations. There was heterogeneity in methods used to assess survival and the discriminative capacity of eGFR equations. Lower eGFR was associated with higher mortality irrespective of the type of equation used. There was insufficient information available to determine whether equations differed as predictors of hospitalisations or major cardiovascular events.

Conclusion: In community dwelling older adults, despite marked heterogeneity in methodologies used between studies, eGFR equations appeared to differ only marginally for predicting survival. There was no evidence that age-specific eGFR equations are superior to CKD-EPI in predicting survival.

PATIENT AND CAREGIVER INVOLVEMENT IN IMPLEMENTING RESEARCH IN CHRONIC KIDNEY DISEASE: A NATIONAL WORKSHOP

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Aim: To identify how consumers can be involved in implementing research in clinical practice and in policy.

Background: Patient and caregiver involvement in research is widely advocated to strengthen the relevance and uptake of evidence. However, there is little documented about patient and caregiver involvement in implementing research.

Methods: We convened a national workshop involving patients with CKD and caregivers ($n = 31$) and health professionals ($n = 66$) from Australia. Across 10 facilitated breakout groups, participants discussed how consumers can be involved in implementing research in practice and in policy. Transcripts were analysed thematically.

Results: Three themes (implementation strategies) were identified. 'Building engagement and familiarity' included involving patients/caregivers early in the research design and ensuring access to research outputs so consumers can gain knowledge to communicate for implementation confidently. 'Harnessing the consumer voice in advocacy' meant embedding research in shared decision-making and engaging with professional societies, political leaders, and reaching out through community. 'Embracing collaboration' was about cultivating a research environment with a consumer centric focus, enabling consumers to contribute ideas and drive more impactful research to stimulate change in clinical practice and policy.

Conclusions: Patients with CKD and caregivers emphasised that fostering early engagement starting from the early stages of research, empowerment with knowledge of the research, and strategic advocacy efforts are needed to implement research in healthcare delivery and in policy reforms.

CONSUMER INVOLVEMENT IN RESEARCH IN CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW

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Aim: To describe the current landscape of consumer involvement in chronic kidney disease (CKD) research, focusing on roles, impact, and challenges.

Background: Consumer involvement in research is vital for ensuring relevance, impact, and applicability of findings. However, the current extent of consumer involvement within CKD research remains underexplored.

Methods: We conducted systematic review of studies that described consumer involvement in research in CKD. Consumer involvement was defined as any research activity that involved one or more consumers in any aspect or stage of the project. We ascertained how consumers were identified, what stages of research they were engaged in and how they were involved in these stages.

Results: We included 106 articles involving over 4500 consumers from 15 countries. Consumers were identified mainly through clinical and patient networks based on demographics/clinical characteristics and personal experience/attributes. Consumers were predominantly engaged in informing study design with limited decision-making roles. Forty-eight studies (45%) described patient/caregiver involvement priority setting, and 57 (53%) in research design, while there were fewer studies that addressed patient/caregiver involvement in implementation ($n = 28$,26%) and evaluation ($n = 24$,22%). Most articles (99%) were from high income, predominately English-speaking countries. Benefits of consumer involvement included enhanced recruitment/retention and enriched data.

Conclusions: Consumer involvement in CKD research were often confined to specific tasks with limited influence. Increasing resources and training for consumers and researchers could enhance their meaningful engagement. Ongoing evaluation of processes and impacts of consumer involvement, including reporting/publishing, is needed to strengthen evidence and practice of consumer involvement in CKD research.

PATIENT-REPORTED OUTCOME MEASURES FOR LIFE PARTICIPATION IN PATIENTS WITH CHRONIC KIDNEY DISEASE: A SYSTEMATIC REVIEW

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Aim: To identify the characteristics, content, and psychometric properties of patient-reported outcome measures (PROMs) used to assess life participation in patients with chronic kidney disease (CKD) not requiring kidney replacement therapy (KRT).

Background: Patients with CKD have an increased risk of mortality and morbidity compared to the general population which can limit life participation. Despite being an outcome of critical importance to patients and caregivers, life participation is rarely included in trials in patients with CKD.

Methods: We searched MEDLINE, Embase, PsycINFO, and CINAHL from inception to February 2023 for all observational studies and randomised control trials in which patients with CKD reported life participation using a PROM. The characteristics, psychometric properties of these measures, and dimensions of life participation were extracted and analysed.

Results: From the 114 studies included, 20 (18%) were randomized trials, 3 (3%) were non-randomized trials, and 91 (80%) were observational studies. Forty-one different measures were used to assess life participation, of which six (15%) were author-developed measures. Twelve (29%) measures assessed life participation specifically, while 29 (71%) measures assessed broader constructs such as quality of life, which included questions on life participation. The SF-36 and KDQOL-SF were the most frequently used, in 39 (34%) and 24 (21%) studies, respectively. None of the measures for life participation were developed specifically for CKD. Four measures (EQ-5D-3L, FACT-An, SF-6D, and SF-36) had validation data in patients with CKD.

Conclusions: There is a high degree of inconsistency in the PROMs used across studies. Importantly no measure specific for life participation has been appropriately validated in patients with CKD. Developing a content-relevant and validated measure is needed to better support shared decision-making, generate meaningful evidence.

MAGNETIC RESONANCE SPECTROSCOPY IN CHRONIC KIDNEY DISEASE: THE DISCERN-CKD STUDY

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Aim: To explore magnetic resonance (MR)-based technologies for identifying and evaluating disease progression in chronic kidney disease patients.

Background: MR technologies offer a diverse range of diagnostic methodologies including MR imaging (MRI) and the less-used MR spectroscopy (MRS). MRI modalities such as Diffusion-Weighted Imaging (DWI), native T1 mapping and blood-oxygenation level dependent MRI are leading the charge in assessment of kidney fibrosis. Our lab has also been investigating proton MRS (1H MRS) for the assessment of kidney fibrosis in vivo. 1H MRS uses the principles of nuclear MRS to build a profile of parenchymal 1H-containing metabolites present at a sufficient concentration and "mobility" to be visible. Typical metabolites that can be identified include creatine, choline and various lipid residues.

Methods: Using a 3 T Prisma MRI system coupled with a 60-channel body coil, single-voxel spectroscopy of the renal cortex was performed. Native T1 mapping and DWI were also conducted during the same imaging session. CKD patients ($n = 28$, stages 3a-5) and living kidney donors ($n = 7$) were recruited for the study. Spectrum peaks of specific metabolites were identified, and intensities were measured.

Results: Metabolite ratios of various lipid signatures (unsaturated lipid, methylene and methyl groups) were able to distinguish between the kidneys of patients with CKD and living kidney donors (AUC >0.83, $p < 0.01$). Apparent diffusion coefficient (ADC) and T1 values determined through DWI and native T1 mapping, respectively, have also been collected and can be combined with spectroscopy data for higher accuracy assessment.

Conclusions: In vivo assessment of kidney disease using a multiparametric approach (1H MRS, DWI and T1 mapping), has the potential to provide non-invasive quantification of kidney fibrosis without the need for ionising radiation exposure.

POST-OPERATIVE OUTCOMES IN PATIENTS WITH KIDNEY FAILURE RECEIVING CHRONIC KIDNEY REPLACEMENT THERAPY AFTER GYNAECOLOGICAL SURGERY: A BI-NATIONAL DATA LINKAGE STUDY

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Aim: To evaluate post-operative outcomes in patients with kidney failure (KF) on chronic kidney replacement therapy (KRT) following gynaecological surgery.

Background: Patients on chronic KRT experience higher rates of gynaecological disease, surgery-related morbidity, and mortality compared to the general population. Despite this, research on post-operative outcomes following gynaecological surgery in this population remains limited.

Methods: This binational data-linkage study identified 403 patients on chronic KRT from the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry between 2000 and 2015 who underwent major gynaecological surgeries. The primary outcome was in-hospital/30-day mortality. Secondary outcomes included infective, medical, and wound complications, transfusion requirement, ICU admissions, readmissions, and dialysis/transplant-specific outcomes. Univariable logistic, multivariable logistic and multivariable negative binomial regression models were used to model outcomes.

Results: Of the 403 patients, the majority had an abdominal hysterectomy (30.5%), or ovarian surgery (50.4%) and were transplant recipients (47.1%). In-hospital/30-day mortality and morbidity rates were 1.2% (95% CI:0.5–3.0) and 30.8% (95% CI:26.3–35.6), respectively. Patients undergoing vaginal hysterectomy had lower odds of blood transfusion requirement (aOR:0.40, 95% CI:0.16–0.98), ICU admission (aOR:0.28, 95% CI:0.09–0.80), and shorter length of stay (IRR:0.74, 95% CI:0.55–0.99) compared to those undergoing abdominal hysterectomy. Post-operative mortality was highest in patients on peritoneal dialysis (PD; 6.9%, 95% CI:1.2–24.2, $p = 0.026$). Patients on PD also had higher odds of blood transfusion requirement (aOR:2.84, 95% CI:1.12–7.21) and longer length of stay (IRR:1.58, 95% CI:1.07–2.33) compared to haemodialysis patients, while kidney transplant recipients had lower ICU admission rates (aOR:0.22, 95% CI:0.09–0.52) and shorter length of stay (IRR:0.75, 95% CI:0.58–0.96). Emergency admissions and older age were associated with worse outcomes.

Conclusions: Patients on chronic KRT undergoing gynaecological surgery demonstrated low post-operative mortality but significant morbidity, especially among older patients, those on PD, and following emergency surgery.

OUTCOMES OF EARLY ANTIVIRAL TREATMENT IN AMBULATORY COVID-19 END STAGE KIDNEY DISEASE PATIENTS: AN OBSERVATIONAL, SINGLE-CENTRE EXPERIENCE

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Aim: To assess the safety of early antiviral treatment of COVID-19 in a high-risk group of ambulatory end stage kidney disease (non-dialysis dependent), dialysis dependent and renal transplant patients as well as effects on hospitalisation and mortality.

Background: In this cohort, infection with COVID-19 can result in increased morbidity and mortality. There is a paucity of data on COVID-19 antiviral treatment outcomes in the ambulatory setting of this group. Furthermore, there is conflicting literature on the use of antivirals, specifically remdesivir, in dialysis patients due to nephrotoxicity.

Methods: Data on patient demographics, antiviral treatment and outcomes inclusive of hospitalisation, 30-day mortality and adverse drug events of 160 ambulatory end stage kidney disease and renal transplant patients with COVID-19 were collected from the hospital's electronic medical record between January 2022 and January 2024.

Results: Of the 160 patients, 117 (73.1%) received outpatient treatment while the rest did not receive treatment either due to ineligibility, patient refusal or had completed therapy as inpatients. Five of the 117 patients had adverse effects secondary to treatment- namely, medication-related transient hypo/hypertension. Thirty of the 160 patients (18.7%) were admitted to hospital within 3 weeks of their COVID diagnosis. The majority of these (66.7%) were admitted for Covid-19 related causes, including 4 due to outpatient treatment administration logistics. The remainder of the admissions (33.3%) were for non-COVID-19 related causes. Mortality directly due to COVID-19 was only 0.01%.

Conclusion: Our study shows that early treatment of COVID-19 in a high risk, vulnerable group is effective in reducing hospitalisation and mortality with minimal adverse effects.

PROTEOMIC INSIGHTS LINK SUGT1 AND NEK8 TO CYST FORMATION IN NEPHRONOPHTHISIS

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Aim: This study aims to investigate the role of Nek8 mutations in the pathogenesis of nephronophthisis (NPHP) and identify novel associated dysregulated proteins and pathways.

Background: NPHP is an autosomal recessive cystic kidney disease and a leading cause of end-stage-renal-disease in childhood or adolescence. NPHP is caused by single nucleotide polymorphisms in ciliary proteins and belongs to a class of diseases termed "ciliopathies." This study investigates mutations in a ciliary protein, Nek8, which has been implicated in the pathogenesis of NPHP9.

Methods: Multipronged label free proteomic analysis compared cell lines harbouring pathogenic Nek8 mutations (H425Y, G442V, and R644C) versus wild-type (WT) Nek8. Label free global proteomics was then performed comparing kidney tissue from Lewis-Polycystic-Kidney (LPK) rats, a model of NPHP harbouring the homologous rodent R650C Nek8 mutation, relative to WT Lewis rats. In-silico network analysis was performed for the Nek8 interactome using differentially expressed proteins in a BIOGRID database. Differentially expressed proteins were manually curated from the Nek8 interactome, and expression was validated in 12-week-old Lewis and LPK kidneys using western blotting or 3,3′-diaminobenzidine (DAB) staining, respectively.

Results: Proteins associated with the cell cycle, DNA damage, mitochondrial function, and cytoskeletal remodelling were significantly dysregulated in LPK rats relative to Lewis rats. Of these, suppressor of G2 allele of SKP1 homologue (SUGT1), a known Nek8 interactor, was significantly higher in LPK kidneys than in Lewis kidneys. This was validated through immunoblots ($p < 0.05$). DAB staining for SUGT1 in Lewis rats predominated in the renal cortex, whereas in LPK rats it presented within the epithelial cells lining cysts.

Conclusion: These findings set a foundation for dedicated studies investigating potential pathological mechanisms resulting in kidney cysts via the SUGT1-Nek8 axis.

REPORTING THE INVOLVEMENT OF PATIENTS AND CAREGIVERS IN IDENTIFYING AND DESIGNING INTERVENTIONS FOR HEALTH RESEARCH: THE IDEAS FRAMEWORK

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Background and Aims: Patient and caregiver involvement in health research can maximise the relevance and uptake of research findings. However, there is little guidance for reporting the involvement of patients and caregivers in the identification and design of health interventions, including in research in chronic kidney disease (CKD). We aimed to develop a reporting framework for involving patients and caregivers in identifying and designing interventions for health research.

Methods: Electronic literature databases were searched for sources (guidelines, frameworks and reviews for conducting, reporting or evaluating patient and caregiver involvement in the identification and design of interventions for research), and primary studies reporting patient and caregiver involvement in interventions to April 2024. A comprehensive list of reporting items based on the identified sources and primary studies was inductively developed. The IDEntifying And designing interventions for health reSearch (IDEAS) framework was piloted with a diverse range of primary studies.

Results: Sixteen sources (e.g. guidelines and frameworks) and 40 primary studies were used to develop the reporting items for the IDEAS framework. The framework includes 14 reporting items that cover five domains: purpose (i.e., role of patients/caregivers, type and scope of interventions, criteria considered e.g. acceptability, feasibility); theory/framework used; population (i.e. inclusion criteria, identification and selection, characteristics); mode of involvement (i.e. process of involvement, frequency, duration, and reimbursement); and output and impact. Each reporting item includes a descriptor and examples.

Conclusions: The IDEAS framework can help to ensure transparency in describing the process of reporting patients and caregivers in identifying and designing interventions for CKD research. Ultimately, this may support the design of interventions that address the needs, preferences and priorities of patients and caregivers with CKD.

PATIENT REPORTED OUTCOME AND EXPERIENCE MEASURES IN CHILDREN AND ADOLESCENTS WITH CHRONIC KIDNEY DISEASE: A SCOPING REVIEW

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Aim: To summarise and synthesise the scope and psychometric properties of patient reported outcome measures (PROMs) and patient reported experience measures (PREMs) utilised in children with chronic kidney disease (CKD) and their caregivers.

Background: PROMs and PREMs are being utilised in research and clinical care, but significant gap exists in the use and evaluation of PROMs and PREMs in children with CKD.

Methods: A comprehensive search of electronic databases was conducted from inception to June 2023. Data extraction and analysis focused on the characteristics, dimensions, and psychometric properties (including validity, reliability, proxy-child agreement and responsiveness, acceptability, and interpretability) of these measures used in children with CKD.

Results: Of the 8733 screened, a total of 178 studies were included in the final analysis. Of these, we identified 94 unique measures, with domains varying from physical functioning, emotional functioning, and social functioning, encompassing single or multiple domains of QoL. The most frequently assessed domains were physical health, mental health, medication adherence and family impact. Only 3 measures were utility-based (HUI, EQ5DY, 17D). The Paediatric Quality of Life inventory (PedsQL 4.0) was commonly used across studies (43%). Of the 94 measures, only 10 (10.6%) had validation data in the paediatric CKD population, 3 showed discriminant validity with differences across treatment modalities. Internal consistency was high across these measures, indicating reliability in both child-reported and parent-proxy reported scales.

Conclusions: This study found considerable variability in the use PROMs/PREMs in studies a of children with CKD, and few were validated in the paediatric CKD population. Addressing this gap by developing a paediatric CKD-specific PROM is imperative to enhance the accuracy and relevance of outcome assessment in paediatrics CKD care.

UPDATE THIAZIDE DIURETIC EVIDENCE REVIEW FOR CARI GUIDELINES KIDNEY STONES RECOMMENDATIONS

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Introduction: The NOSTONE study found that hydrochlorothiazide, compared to placebo, did not reduce the risk of recurrent kidney stones. No kidney stone guideline has been updated since NOSTONE was published. Our aim was to assess the role of thiazides in the prevention of kidney stone recurrence to update the CARI Kidney Stones guidelines.

Methods: We integrated the NOSTONE trial into a high-quality systematic review on thiazide role in reducing recurrent kidney stones. New studies underwent dual data extraction and critical appraisal. Data was pooled using random-effects meta-analysis, dichotomous effect estimates were expressed as risk ratios (RR) and absolute effects calculated. Heterogeneity was assessed using I2

statistic. Subgroup analyses were conducted, exploring differences between short-acting versus long-acting thiazides, placebo versus no treatment, and the impact of reported concomitant high fluid and low sodium diet intake. The certainty of the evidence was rated using GRADE.

Results: Thiazides may decrease symptomatic recurrence of kidney stones (9 studies, $n = 997$, RR 0.55, 95% 0.37–0.84; $I^2\% = 68\%$; absolute effects—202 fewer per 100 000 person years, 95% CI 285–72 fewer; low certainty evidence). Effect modification was evident when short-term versus long-term thiazides were compared (test for subgroup differences $p = 0.02$; $I^2 = 82.8\%$). RCTs contrasting thiazides with standard of care without a placebo may have overstated efficacy compared to the six RCTs that compared to placebo. Moreover, RCTs with low risk of bias for allocation concealment displayed little difference in kidney stone recurrence compared to the seven RCTs that were high or unclear risk. Concomitant nutrition therapy did not modify effects.

Conclusions: Thiazides should remain in the armamentarium for preventing kidney stones, but physicians should carefully consider clinical, demographic, and practical aspects in collaboration with patients.

GENERAL NEPHROLOGY—PREGNANCY ASSOCIATED

HOSPITAL ADMISSIONS DURING THE FIRST 10-YEARS OF LIFE IN CHILDREN BORN TO KIDNEY TRANSPLANTED MOTHERS

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Aims: To understand the morbidity of children of transplanted mothers (C-Tx) at birth and early childhood compared to those of mothers not exposed to kidney replacement therapy (C-non-KRT).

Background: Despite high preterm birth and perinatal risk, little is known about post-birth health of C-Tx.

Methods: We used linked Australia and New Zealand Dialysis and Transplant Registry (1970–2016), perinatal (births ≥20 weeks gestation, 1991–2013) and hospital admission datasets (until 2018) in SA, WA, ACT and NSW.

Results: Among 1 865 425 babies with 6 063 327 hospital admissions, C-Tx had 137 birth and 551 subsequent admissions (99 babies), with a median follow-up of 2.5 years [IQR: 0.9–5.3] (vs. 2.9 years [1.1–5.4] C-non-KRT, $p = 0.03$). Admissions per child were similar across groups: 40% had one admission, 20% had two, 15% had three, 5% had four, and 20% had five or more ($p = 0.07$).

C-Tx had longer birth admissions (median 6 days, [IQR: 4–16]) than C-non-KRT (3 days, [2–5], $p < 0.001$). They had more conditions originating in the perinatal period during birth admission (70% vs. 34% C-non-KRT) and subsequent admissions (22% vs. 8% C-non-KRT), $p < 0.001$. These were disorders related to length of gestation/fetal growth, respiratory/cardiovascular, haemorrhagic/haematological, endocrine/metabolic, infections, and maternal factors/complications of pregnancy, labour and delivery, and $\sim$3–5 times higher in C-Tx ($p < 0.05$).

Prematurity (57% C-Tx vs 8% C-non-KRT) and pre-eclampsia (30% Tx vs. 6% non-KRT) were explored as critical factors affecting neonatal health. Major diseases during birth and subsequent admissions were similar between preterm C-Tx and preterm C-non-KRT. C-Tx with pregnancy-induced hypertension (including pre-eclampsia) had more perinatal-origin conditions (80% vs. 51%), $p < 0.001$.

Conclusions: Australia's first study on post-birth outcomes for C-Tx revealed differences in hospitalisation rates and characteristics, warranting further research into C-Tx follow-up.

INCIDENCE OF PREECLAMPSIA AND HYPERTENSIVE DISORDERS IN PREGNANCY AMONG AUSTRALIAN ABORIGINAL WOMEN: THE ARDAC STUDY

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Aim: We estimate the incidence of preeclampsia/hypertensive disorders of pregnancy (HDP), and the associated pregnancy outcomes using the well-established kidney health cohort study: Antecedents of Renal Disease in Aboriginal Children and Young People (ARDAC) Study.

Background: Women experiencing HDP/preeclampsia have an increased risk of developing chronic conditions later in life. Established in 2002, the ARDAC Study provides a unique opportunity to understand the incidence and impact of preeclampsia/HDP for Aboriginal and non-Aboriginal women.

Methods: In 2023, ARDAC was linked with Australian administrative state and federal datasets, including perinatal and hospital admissions data. We conducted an analysis of all women who had births since enrolment in ARDAC and identified preeclampsia/HDP from the perinatal and hospital admissions datasets.

Results: Of 1847 female ARDAC participants, 781 (42.3%) women (57.7% Aboriginal, 42.3% non-Aboriginal) birthed 1590 infants across New South Wales and ACT since enrolment. Their mean age was 26.2-years (SD 2.30) with mean 15.3-years follow-up (SD 3.9). Results indicate 1/15 pregnancies experienced preeclampsia/HDP, with 1/10 women experiencing preeclampsia/HDP in at least one pregnancy. While Aboriginal women had the same risk of developing preeclampsia/HDP as their non-Aboriginal counterparts (OR 1.02, 95% CI 0.67–1.57), 2% of Aboriginal women's pregnancies resulted in a baby who was stillborn (0% among non-Aboriginal women). However, for singleton live-births, Aboriginal women who experienced preeclampsia/HDP did not have higher risk of low-birth weight infants (OR 1.09, 95% CI 0.42–3.12).

Discussion: Our results show similar risk of preeclampsia/HDP for Aboriginal and non-Aboriginal women, however, common poor birth outcomes associated with preeclampsia/HDP, such as low birthweight infants or stillbirth, was varied between Aboriginal and non-Aboriginal women.

HAEMODIALYSIS—CKD-MBD/ANAEMIA/ADEQUACY

A CORE OUTCOME SET FOR TRIALS IN CHRONIC KIDNEY DISEASE: REPORT OF THE STANDARDISED OUTCOMES IN NEPHROLOGY—CHRONIC KIDNEY DISEASE (SONG-CKD) STAKEHOLDER WORKSHOPS

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Aim: As part of the global Standardised Outcomes in Nephrology—Chronic Kidney Disease (SONG-CKD) initiative, we aimed to establish a consensus-based set of core outcomes for trials in CKD (prior to the need for kidney replacement therapy).

Background: The omission of outcomes of importance to patients with chronic kidney disease (CKD) and their caregivers from trials can impede decision-making based on patient-centered outcomes.

Methods: In nephrology, the global Standardised Outcomes in Nephrology (SONG) initiative commenced in 2015 and has since established core outcome sets for haemodialysis, kidney transplantation, peritoneal dialysis, children with CKD, polycystic kidney disease, and glomerular disease. Most recently, the SONG-CKD was launched to establish core outcomes for trials in patients with CKD not requiring kidney replacement therapy. To finalise the set of core outcome domains for CKD, we convened two international multistakeholder workshops in English and Spanish language to discuss the proposed core outcomes that were identified through focus groups with nominal group technique conducted in four countries, an international Delphi survey, which collectively involved over 383 patients/caregivers and 407 health professionals from 63 countries.

Results: The discussions on establishing and implementing core outcomes for CKD are summarised into four themes:

Reflecting a comprehensive approach to health.
Facilitating patient empowerment in their own care.
Ensuring applicability to broad geographic areas and populations.
Feasibility for implementation.

Conclusion: Patients, caregivers, and health professionals agreed that mortality, kidney function, life participation and cardiovascular disease should be established as core outcomes for trials in CKD.

OUTCOMES FOR CLINICAL TRIALS INVOLVING ADULTS WITH CHRONIC KIDNEY DISEASE: A MULTINATIONAL DELPHI SURVEY INVOLVING PATIENTS, CAREGIVERS AND HEALTH PROFESSIONALS

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Aim: To generate consensus among patients/caregivers and health professionals (HP) on critically important outcome domains for trials in Chronic Kidney Disease (CKD) prior to the need for Kidney replacement therapy (KRT), and to describe the reasons for their choices.

Background: Many outcomes of high priority to patients and clinicians are infrequently and inconsistently reported across trials in CKD, which generates research waste and limits evidence-informed decision making.

Methods: This was an online two-round international Delphi survey. Adult patients with CKD (all stages and diagnoses), caregivers and HP who could read English, Spanish or French were eligible. Participants rated the importance of outcomes using a Likert scale (7–9 indicating critical importance) and a Best–Worst Scale. Comments were analysed thematically.

Results: In total, 1399 participants from 73 countries completed Round 1 of the Delphi survey, including 628 (45%) patients/caregivers and 771 (55%) HP. In Round 2790 participants (56% response rate) from 63 countries completed the survey including 383 (48%) patients/caregivers and 407 (52%) HP. The overall top five outcomes were: kidney function, need for dialysis/transplant, life participation, cardiovascular disease and death. In the final round, patients/caregivers indicated higher scores for most outcomes, and HP gave higher priority to mortality, hospitalisation and cardiovascular disease

(mean difference > 0.3).Four themes reflected the reasons for their priorities: imminent threat of a health catastrophe, signifying diminishing capacities, ability to self-manage and cope, and tangible and direct consequences.

Conclusion: Across trials in CKD, the outcomes of highest priority to patients, caregivers and HP were kidney function, need for dialysis/transplant, life participation, cardiovascular disease and death.

HAEMODIALYSIS—OTHER

ANTICOAGULATION IN A HAEMODIALYSIS COHORT; A SINGLE CENTRE REVIEW

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Aim: To assess indications for anticoagulation in haemodialysis (HD) patients, adverse events and prescribing responsibilities.

Background: There is an increased incidence of atrial fibrillation (AF) and venous-thromboembolism in HD patients. Current data is limited regarding safety and efficacy of long-term anticoagulation in this population. Management of warfarin is labour intensive.

Methods: Patients across three HD sites were included. Data was collected via medical notes and patient surveys. The primary outcome was anticoagulation prevalence and indication. Secondary outcomes included adverse events, incidence of falls, frailty, and prescribing responsibilities.

Results: 116 patients were included; 20 (17%) were prescribed anticoagulation. Of these, 12 (60%) were on warfarin and 8 (40%) were on Apixaban. The mean age was 68.6 ± 9.3 years and 35% were female. 45% of patients had been on anticoagulation for ≥3 years. The main indications for anticoagulation were AF (40%) and fistula preservation (30%). Of the 12 patients prescribed warfarin, 9 (75%) had their INR managed by their HD unit, with 11(92%) having INR checks weekly or more, despite stable dosing. Two patients had a major bleed and two others had a minor bleed. Four patients (20%) reported a fall in the preceding 6 months. Median frailty score (using the Clinical Frailty Scale) was 4, indicating 'very mild' frailty. All falls occurred in those with frailty scores of ≥4.

Conclusion: Anticoagulation is frequently prescribed in our HD units, despite limited evidence, particularly regarding fistula preservation. INR management by the HD unit leads to over investigation and additional burden in already under-resourced HD units. The long duration of anticoagulation with co-existing frailty and falls highlights the need to frequently reassess indication and suitability for anticoagulation.

FGF23 AND SARCOPENIA IN MAINTENANCE DIALYSIS POPULATION

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Aim: This study aimed to determine the relationship between fibroblast growth factor 23 (FGF23) and muscle-related parameters and to assess the effect of FGF23 on skeletal muscle myoblasts.

Background: Sarcopenia is defined as loss of muscle mass, strength and/or performance. It is strongly associated with all-cause mortality. FGF23 is markedly elevated in the dialysis-dependent population. It has previously been shown to have a direct role in cardiac dysfunction. However, its role in skeletal muscle and development of or protection from sarcopenia is uncertain.

Methods: A cross-sectional study examining 81 dialysis-dependent patients was conducted. Sarcopenia was defined in accordance with accepted international criteria. Clinical assessment included bioelectrical impedance analysis, anthropometric measurement, handgrip strength, and physical performance appraisal. The direct effect of FGF23 on human skeletal muscle myoblast proliferation and myogenic differentiation were assessed using an in vitro culture system.

Results: FGF23 levels were positively associated with handgrip strength ($r = 0.27$, $p = 0.01$) and calf circumference ($r = 0.27$, $p = 0.01$) and, on multiple regression analysis found to be a significant independent predictor of both handgrip strength (beta = 5.39, 95% CI 2.07–8.72) and sarcopenia (OR = 0.14, 95% CI 0.02–0.75). FGF23 was found to promote myoblast proliferation though not differentiation. At 48 hr of differentiation, the expressions of MyoG and MyoD were significantly lower in cells treated with FGF23 than the control. The fusion index and myotubes diameters were reduced on day 7 of differentiation in FGF23-treated cells as compared to the control.

Conclusions: FGF23 was directly associated with stronger handgrip strength and inversely with sarcopenia. Our findings suggest that supraphysiological levels of FGF23 might play a role in muscle regeneration by promoting myoblast proliferation but repressing myogenic differentiation to support expansion of the proliferative pool.

HAEMODIALYSIS—VASCULAR ACCESS

CHANGE IN KIDNEY FUNCTION PRIOR TO COMMENCING HAEMODIALYSIS—IS UNEXPECTED DECLINE A COMMON REASON FOR LACK OF PREPARATION?

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Aim: To determine whether patients who commenced haemodialysis (HD) with a tunnelled-central venous catheter (T-CVC) had a faster rate of decline of kidney function immediately prior to reaching kidney failure compared to patients commencing HD with definitive dialysis access.

Background: A Victorian survey exploring reasons why patients started HD with T-CVC, rather than definitive vascular access, demonstrated that clinicians deemed faster than expected deterioration in kidney function as the cause of T-CVC use in approximately a quarter of these patients.

Methods: A single-centre retrospective study, including all patients who commenced HD over 5 years. Patients were divided into two groups: definitive access (first HD via arteriovenous fistula/graft) or T-CVC. Estimated glomerular filtration rate (eGFR) was analysed at various time-points prior to HD, at establishment of access, and at HD commencement. A subject-specific, mixed-linear model to compare the rate of eGFR decline between the two groups was developed.

Results: 401 patients commenced HD over the five-year study period, 115 with a T-CVC and 231 with definitive access (55 patients excluded from analysis). Age, eGFR at access creation, and eGFR at first access use were similar between groups. Definitive access group had a higher proportion of patients with diabetes mellitus, hypercholesterolaemia, proteinuria and angiotensin blockade. Analysis of eGFR at clinical timepoints, demonstrated consistent overlap in confidence intervals between groups. Mixed model identified no statistically significant categorical variables.

Conclusions: Equivocal difference was seen in the rate of eGFR decline in patients commencing HD with T-CVC compared to definitive access. Different tools and models of care are required for patients with advanced CKD to predict kidney failure and establish definitive HD access in a timely fashion.

A NOVEL TOOL FOR THE DETECTION OF NEEDLE FEAR IN PRE-DIALYSIS AND DIALYSIS PATIENTS—MEASURING NEEDLE FEAR (MNF) TOOL

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Aim: To develop a validated tool for identifying needle fear in patients awaiting or already receiving haemodialysis.

Background: Needle fear is common among haemodialysis patients, particularly when starting treatment, and can impact their therapy choices, engagement, and quality of life. The lack of validated tools to identify needle fear before dialysis begins and paucity of management options leaves many patients unsupported.

Methods: Leveraging our background qualitative studies defining the physical and psychological elements of dialysis needle fear and utilising consumer-centred co-design, we performed a three-phase process to create and validate a survey tool for measuring needle fear (MNF tool). This process involved item generation, questionnaire development and testing, and questionnaire evaluation.

We validated and tested the MNF tool in 150 adult South Australian patients awaiting or receiving maintenance haemodialysis.

Results: Forty items were formatted into physical, cognitive, emotional and behavioural domains. The mean of the Content Validity Index across all items was: S-CVI = 0.92. Inter-rater reliability was assessed in a convenience sample of 19 patients using Gwet's AC1 measure of agreement. 36 items had Almost perfect (.61–.80) and 4 had substantial (.81–1.00) coefficient agreement range. Exploratory factor analysis revealed Pearson chi2(1) = 18.69 $P < 0.001$. The area under the ROC curve was 0.966 (95% CI: 0.93–1.0). Percentage correctly classified is greatest at MNF Score ≥ 9, hence a cut-off score was set at >8.

Conclusion: The MNF tool was developed and validated, with a score >8 suggestive of patients at highest risk of clinically significant needle fear. The MNF tool can improve identification and management of this hidden treatment burden, and potentially be applied to other chronic disease cohorts with high needle burden.

A FLOW PROFILE—MODELLING PHYSIOLOGIC BLOOD FLOW IN ARTERIOVENOUS FISTULAS FOR USE IN MACROFLUIDIC SYSTEMS

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Aim: To model arteriovenous fistula (AVF) blood flow profiles for use in vascular research.

Background: Microfluidic in vitro models, typically engineered on micron length-scales, can establish precise microenvironments simulating pulsatile, steady, or oscillatory flows patterns. Though these systems have revolutionised cell culture techniques, their scale means the translatability to large vessel geometries has remained questionable. A critical step in creation of a realistic macrofluidic model is

replication of true blood flow patterns. In this study, we modelled physiologic blood flow using a programmable peristaltic pump.

Methods: Patient AVFs were imaged using an ultrasound machine with both b-mode and Doppler recordings captured. Doppler recordings of the proximal artery feeding the AVF were gated to a real-time patient electrocardiogram. The recorded profiles were then digitised over one cardiac cycle. Various waveform characteristics were extracted and used to program a peristaltic pump. Using an ultrasound flow meter the waveforms generated by the peristaltic pump were captured.

Results: Fourteen patient AVF waveforms were analysed. The averaged waveform parameters included a cardiac cycle of 0.85 s, a blood flow across one cardiac cycle of 595.6 ± 280.8 mL/min, a diastolic blood flow of 463.0 ± 239.06 mL/min, and a peak blood flow of 779.24 ± 352.11 mL/min. Patient-specific AVF waveforms were then used to successfully program a simple peristaltic pump to produce a physiological pulsatile output.

Conclusions: These strategies demonstrated patient-specific physiologic blood flow patterns can be programmed for a macrofluidic cell culture system. This will enable investigation of how different pulsatile flow patterns affect cell signalling in patient-specific geometries.

PRINTCISION MEDICINE: A RE-USEABLE, 3D-PRINTED, PATIENT-SPECIFIC IN VITRO MODEL OF ARTERIOVENOUS FISTULAS FOR ENDOTHELIAL CELL STUDIES

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Aim: To use 3D-printing to create patient-specific models of arteriovenous fistulas (AVF) for vascular research.

Background: In Australia, 10% of adults have CKD with about 15 000 on dialysis. For those on haemodialysis, vascular access is best achieved using a native AVF. Though the molecular mechanisms underpinning AVF maturation are not well-established, endothelial cells appear to play a key role in successful vessel remodelling. Standard cell culture provides valuable insight into endothelial cell function, but the flat surface neglects the complex physiology of disturbed blood flow through intricate vessel geometries. We have developed and refined a macrofluidic model of AVFs using true patient geometries.

Methods: Patient AVFs were imaged using a modified ultrasound machine, digitally segmented to generate AVF geometries, and 3D-printed using a water-soluble filament. Prints were cast in silicone and dissolved leaving an AVF-shaped cavity. Human dermal microvascular endothelial cells (HMEC-1) were cultured on the internal surface of these models. Custom components were fabricated to create a flow circuit using autoclave-sterilisable materials. Patient-specific AVF Doppler recordings were used to program a peristaltic pump.

Results: Immunofluorescence with DAPI and Phalloidin confirmed the presence of a HMEC-1 monolayer on the luminal surface of the patent-specific AVF models. Using autoclave sterilised components, the flow circuit ran for 10 days without bacterial contamination. Pulsatile flow was successfully achieved using the programmable peristaltic pump.

Conclusions: Our macrofluidic device overcomes many of the limitations of current cell culture techniques. By using patient-specific geometries, physiologic pulsatile flow, and running flow experiments over biologically relevant timelines, this novel in vitro model will facilitate investigation of endothelial cell biology under patient-relevant conditions.

INDIGENOUS HEALTH ADVANCEMENT

PREFORMED DIALYSIS ACCESS FOR ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLE: WE CAN DO BETTER

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Aim: To establish the differences in rates of preformed dialysis access between Aboriginal and Torres Strait Islander people and non-Indigenous Australians.

Background: It is an established priority for Aboriginal and Torres Strait Islander people living with kidney failure to have access to best practice care. Commencing dialysis with preformed access (arteriovenous fistula, arteriovenous graft, or peritoneal dialysis catheter) is considered best practice however rates remain low. Data for Aboriginal and Torres Strait Islander is limited.

Methods: Using the Australia and New Zealand Dialysis and Transplantation Registry (ANZDATA), we considered all adult patients who commenced chronic dialysis, in Australia, between 1/1/2004 and 31/12/2020. We compared rates of preformed access between Aboriginal and Torres Strait Islander and non-Indigenous people by logistic regression and evaluated the impact that remoteness and late referral had on the association.

Results: During the study period 43 273 people commenced dialysis, 24 516 (56.7%) had performed access. Aboriginal and Torres Strait Islander people ($n = 4596$, 10%) were less likely to commence dialysis with pre-formed access that non-Indigenous people (adjusted odds ratio (aOR) 0.75 CI 0.68–0.83). For Aboriginal and/or Torres Strait Islander people who live remotely, the disparity was greater (aOR 0.45 CI 0.32–0.65). Of the 20% of the cohort referred late, rates of

preformed access were lowest (24.5%), but the association with ethnicity was no longer apparent (aOR 0.87 CI 0.69–1.08).

Conclusion: Aboriginal and Torres Strait Islander people, especially those living remotely, are less likely to receive best-practice care when commencing dialysis. Co-created models to improve the care provided to Aboriginal and Torres Strait Islander people are essential to close the gap in health outcomes.

HOW PATIENT NAVIGATORS CAN IMPROVE PATIENT JOURNEYS FOR ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLE WITH KIDNEY FAILURE: THE COMPASS PROJECT

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Aim: To identify opportunities and barriers to optimal care experienced by Aboriginal and Torres Strait Islander patients undergoing treatment for kidney failure, and identify areas where Aboriginal and Torres Strait Islander Patient Navigators can support culturally safe and coordinated care.

Background: The Connecting Our Mob: Patient navigators As Sustainable Supports (COMPASS) project has established and coordinated Aboriginal and Torres Strait Islander Patient Navigator roles across four sites in urban, regional and remote South Australia and the Northern Territory. This study investigates the effects of these roles, and the facilitators and barriers to sustainably embedding them into mainstream health services.

Methods: Nineteen Aboriginal and Torres Strait Islander patients with kidney failure were recruited for patient journey mapping interviews across Darwin, Alice Springs, Port Augusta, and Adelaide. Interviews were transcribed and validated by patients, and then inductively thematically analysed, informed by Aboriginal and Torres Strait Islander epistemologies and contexts.

Results: Patients experience significant barriers to culturally safe and responsive care. Ineffective communication and care coordination among healthcare providers were ubiquitous across all sites.

Safer patient journeys relied upon family support, connection to culture, and positive relationships with healthcare staff. Potential benefits of Aboriginal and Torres Strait Islander Patient Navigators were identified, including knowledge translation, connecting patients with appropriate supports, and fostering patient self-confidence, self-management and self-determination.

Conclusions: This research is the first step in identifying gaps in renal care and potential opportunities for Aboriginal and Torres Strait Islander Patient Navigators. The next round of patient interviews seek to understand how Patient Navigators offer leadership, cultural and lived knowledge to bridge these gaps, and illustrate the importance of embedding these roles into kidney health services across Australia.

FLIPPING THE SCRIPT: ADDRESSING CULTURAL IMBALANCES IN FIRST NATIONS KIDNEY RESEARCH

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Aim: To co-create strengths-based approaches to Indigenous Governance, embedding collective decision making and ensuring culturally safer spaces, responding to the needs and priorities of First Nations Peoples.

Background: First Nations Peoples experiencing kidney disease are strong and speak back to health systems, leading decolonising practices to co-create a culturally safe, anti-racist health system supported by effective, respectful partnerships. The Aboriginal Kidney Care Together—Improving Outcomes Now Reference Team (A2RT) are Australian First Nations Peoples with lived experience of kidney disease and impacts of lifelong treatment. Yarning about their involvement in leading research and decision-making provides a strong consumer voice.

Methods: AR2T centres cultural knowledge, practices and voices of Aboriginal Kidney Warriors, their families, and communities, with A2RT members involved in decision making through monthly face to face meetings. Relationality over-arches AKction2, as we share skills and knowledge, centering Indigenous ways of knowing, being and doing (epistemology, ontology and axiology) across this project. Active decolonisation involves; Aboriginal people with lived experience of kidney disease positioned as chief investigators, First Nations' cultural and ceremonial practice embedded for reciprocal learning and understanding throughout, with Indigenous leadership across 4 sub-studies: Indigenous Governance, Peer Support, Health Journey Mapping, and Cultural Safety.

Results: A2RT provides invaluable social, financial, and practical support for Kidney Warriors and their families, filling a current gap in mainstream kidney services. Their Indigenous Governance has led to culturally and clinically safer treatment, innovative models of care, and community priorities embedded within National Clinical/Cultural safety Guidelines.

Conclusions: Decolonising Kidney care with First Nations Peoples demands respectful relationship building, ongoing engagement,

Indigenous Governance and leadership, and sustained funding to achieve lifesaving culturally safer practice.

PRIORITISING INDIGENOUS VOICES & STORIES IN KIDNEY RESEARCH—THE TOP END MEDICINAL IRON RESEARCH & STUDY ADVISORY GROUP

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Aim: To disseminate learnings regarding the development of an effective advisory group for clinical trials organsied by and consisting of Indigenous people, and to present the key outcomes and achievements of the advisory group.

Background: Prioritising Indigenous voices in kidney health is a fundamental aim of the INFERR Clinical trial. The INFERR study investigators are working with Indigenous kidney patients through the formation of the Top End Medicinal Iron Research & Study Advisory Group. The advisory group has participated in the study from the beginning, throughout research conduct, analysis and reporting of results. The purpose of the Advisory Group is to provide advice regarding culturally safe conduct of the INFERR research project and to advocate regarding social, cultural and health issues important for dialysis patients across the Top End.

Method: Reference Group meetings were held every quarter at Menzies school of Health in Darwin. Members designed and determined the agenda of meetings to provide feedback and updates to the study team.

Results: The Advisory Group members have ensured dialysis patients' standpoints are at the forefront of the INFERR study. The group have helped construct INFERR educational tools enabling better communication between dialysis patients and study researchers. The group have also given voice to key concerns of dialysis patients within their clinics for study doctors to advocate for changes in service delivery.

Conclusions: The development of the advisory group is dependent on the relationships between the INFERR study researchers and group members. The INFERR study's genuine support for this group, willingness to listen to and address their concerns, has seen in return true investment from members in which key goals for both parties have been achieved.

PREVALENCE OF MARKERS OF LIVER DISEASE AND ASSOCIATION WITH HYPERFERRITINAEMIA IN FIRST NATIONS PATIENTS ON MAINTENANCE HAEMODIALYSIS FROM THE NORTHERN TERRITORY OF AUSTRALIA: A SUB-STUDY OF INFERR CLINICAL TRIAL

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Background: Hyperferritinaemia is common among First Nations Australians on dialysis from the Northern Territory. We explored the prevalence of markers of liver disease and their association with hyperferritinaemia.

Methods: We performed cross-sectional analysis of data from the INtravenous iron polymaltose for First Nations Australian patients with high FERRitin levels on haemodialysis (INFERR) trial. We calculated the prevalence of high liver stiffness as the number with confirmed liver stiffness divided by the total number of validated FibroScan® results. Association of ferritin levels and makers of liver disease were determined using mixed linear models.

Results: The sample included 391 participants (70.9% female, mean age 54.9 (11.5) years). 292 (75.3%) valid scans were analysed (183 (62.7%) first and 109 (35.3%) follow up scans).

Among the 391 participants were 6566 results for serum ferritin, transferrin saturation and markers of liver function. The prevalence of high liver stiffness was 58.2% (28.8% consistent with liver cirrhosis). 56.3% of follow up scans had high stiffness (32% consistent with liver cirrhosis).

Prevalences of abnormal liver function biomarkers (ALT, ALP, bilirubin, GGT, albumin, protein, and globulin) were high.

An association existed between hyperferritinaemia and markers of liver dysfunction (ALT ($p < 0.001$) Albumin ($p < 0.001$) ALP ($p < 0.001$), total bilirubin, ($p < 0.001$), GGT ($p < 0.001$), total protein ($p < 0.001$) and globulin ($p < 0.001$)), liver stiffness ($p = 0.010$), metabolic syndrome (HDL Cholesterol ($p = 0.030$), non-HDL cholesterol ($p = 0.012$, Triglycerides ($p \leq 0.001$)), transferrin saturation ($p < 0.001$) and magnesium levels ($p = 0.011$).

Conclusion: We found high prevalence of liver stiffness and dysfunction and association of hyperferritinaemia with markers of liver disease. Studies need to be performed to confirm liver fibrosis and cirrhosis. The findings have clinical implications for the management of iron therapy and liver disease in this population.

HIDDEN FIGURES: ARE WE LOOKING AT THE RIGHT METRICS FOR TRANSPLANT ACCESS

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Aim: Evaluate performance of measures that monitor access to transplantation for Aboriginal and Torres Strait Islander people.

Background: Access to kidney transplantation for Aboriginal and Torres Strait Islander people in Australia is inequitable. Currently the ANZSN Quality Indicator program reports the proportion of people waitlisted or transplanted at 6 month by units as the metric for transplant access. Variation between units for Indigenous people is not known.

Methods: Data were extracted from ANZDATA Registry for people who started kidney replacement therapy (KRT) from 2017 to 2021 as well as prevalent numbers at 31/12/22. Quality indicators (QI) for transplantation included number/% of patients active the transplant waitlist or transplanted at six, 12, 24, and 36 months after commencing KRT, stratified by Indigenous status. Analyses were restricted to units ($n = 17$) that had >10 Indigenous patients over the analysis period.

Results: Centre-specific transplant QIs at 6 months (QI6m) showed a poor relationship between Indigenous and non-indigenous groups—among units there was low correlation ($r = 0.54$, $p = 0.02$). QI6m was 0% for Indigenous people in 65% of centres, but for non-Indigenous people was 0% in only 5% of centres. For Indigenous-specific unit QIs there was little correlation between early and late transplant QIs (e.g., $r = 0.45$ for QI for 6 vs. 24 months). Examining the proportion of prevalent people (aged < 65) at 31 Dec 22 waitlisted, there was a slightly stronger relationship ($r = 0.61$, $p < 0.01$).

Conclusions: The current ANZSN QI6m for transplantation access does not reflect access for Indigenous people at that unit, nor does the 6 month time point reflect subsequent waitlisting rates. Creating specific and relevant quality indicators for transplant access for Aboriginal and Torres Strait Islander people is critical to driving improvement.

INTERVENTIONAL NEPHROLOGY

OPTIMAL NEEDLE SIZE FOR RENAL TRANSPLANT BIOPSY: A RETROSPECTIVE SINGLE CENTRE STUDY

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Aim: Renal transplant biopsies are a valuable diagnostic tool in allograft dysfunction. This study aimed to investigate the optimal biopsy needle size for efficacy and safety.

Background: Standard renal biopsy needle size differs worldwide, largely between 16G and 18G needles. Previous studies demonstrated lower complication rates with 18G needle, however, there is ongoing concern that this provides inadequate samples. To our knowledge, this is the largest study to date investigating the optimal needle size for renal transplant biopsies.

Methods: We performed a retrospective analysis of transplant kidney biopsies at our centre between 2015 and 2024. 14G, 16G or 18G automated biopsy needles were used under real time ultrasound guidance. Adequate biopsy sample was defined as 10 or more glomeruli.

Results: 2860 biopsies were performed between 2015 and 2024. 1558 with sufficient data were included in our study. More passes were performed with 18G needles (2.34 ± 0.62) than 16G (1.42 ± 0.75) and 14G needles (1.75 ± 0.97). 14G biopsies yielded the most glomeruli (17.92 ± 6.92), followed by the 18G (16.51 ± 7.14), then 16G group (14.69 ± 13.87). Biopsy samples were adequate in 82.9% of 18G biopsies, compared with 77.1% of the 16G group.

No major complications occurred in either the 14G or 18G group, however 6% of 16G biopsies had a major complication. Less total complications occurred in the 18G group (2.4%) compared with 8.3% and 9.3% in the 14G and 16G groups respectively.

Conclusion: The 18G needle when used to obtain two passes, may be superior to the 16G needle in both efficacy and safety in transplant kidney biopsies. These findings are within the limitations of a small 18G group size.

NUTRITION

DOES DIETARY PHOSPHORUS INTAKE DIFFER BETWEEN DIALYSIS AND NON-DIALYSIS DAYS? USING MULTIPLE PASS METHODOLOGY TO PROVIDE THE ANSWER

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Background and Aims: Hyperphosphatemia, a prevalent complication in patients with kidney failure, is associated with increased morbidity and mortality. Effective management of this electrolyte imbalance remains a significant challenge. Therefore, a comprehensive understanding of dietary habits, including the differential phosphorus intake across dialysis and non-dialysis days, is crucial. The aim of this study was to quantify the disparity in dietary phosphorus consumption between these days by assessing repeated diet histories utilising a multi-pass methodology.

Methods: Forty six participants (66% male, age 70 ± 13.3 years) with kidney failure undertaking dialysis completed three diet histories (including dialysis and non-dialysis days) using multiple pass methodology collected by a trained renal dietitian. Nutrient analysis was

conducted using the Australian specific nutrient analysis program FoodWorks V.10.

Results: There was no significant difference in dietary phosphorus intake between dialysis and non-dialysis days (mean intake dialysis day was 1255 mg ± 465 mg; mean intake non-dialysis day 1324 mg ± 406 mg, $P = 0.217$) (Table 1). This was also the case for dietary energy, protein, fibre, and sodium. Potassium intake differed between dialysis and non-dialysis days (dialysis day mean intake 2191 ± 813 versus non-dialysis day mean intake 2478 ± 779, $p = 0.036$).

Conclusions: In this study, we determined that dietary phosphorus intake in people undertaking haemodialysis did not differ between dialysis and non-dialysis days. In fact, most nutrients did not vary except for dietary potassium.

To our knowledge this is the first study to demonstrate that assessment of dietary phosphorus intake can occur on any day. Understanding barriers to eating on different days, environmental factors combined with dietitian support provides reliable information for the development of targeted interventions to optimise phosphate management in dialysis patients.

DIET IN THE MANAGEMENT OF NON-DIALYSIS DEPENDENT POLYCYSTIC KIDNEY DISEASE (PKD): PERCEPTIONS AND EXPERIENCES OF PATIENTS LIVING WITH PKD

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Aim: Explore the views of patients living with non-dialysis dependent PKD on the role of diet in disease management and their experiences with dietary change.

Background: Nutrition recommendations that have been shown to reduce PKD progression can be confusing and adherence difficult. Access to renal dietitians prior to dialysis is often limited. Reducing progression towards dialysis remains the primary goal for patients. Little is known about the patient experience of dietary changes and their perceptions of the role of nutrition.

Methods: A 32-item online survey was distributed via patient-advocacy kidney organisations and semi-structured patient interviews were undertaken. Data was analysed descriptively and qualitatively. Survey data were assessed to determine associations (SPSS v28). Interview data was analysed thematically (Dedoose).

Results: PKD patients ($n = 745$) completed the survey (76% female, 80% over 50yo, 49% in stages 3–5 PKD). Diet for PKD management was rated as very-extremely important (88%). Over 70% of patients reported not being referred to a dietitian by their nephrologist. Referrals were significantly less likely for those with stages 1–3 CKD ($p < 0.001$). Ten patients were interviewed (50% female, mean eGFR43mL/min and age 50 years). Three themes emerged: patients' perceptions of nutrition importance were not matched to their nephrologist's, patients' were left to undertake their own research into nutrition recommendations to reduce progression and routine support from renal dietitians is desired.

Conclusions: Diet is perceived as an important part of PKD management but patients are inadequately referred to renal dietetic services to slow disease progression. Raising nephrologists awareness regarding the evidence on diet and PKD progression is needed. Also advocating for changes in models of care to facilitate funding for earlier access to renal dietetic services.

RELIABILITY, REPRODUCIBILITY AND AGREEMENT BETWEEN PRE DIALYSIS VS MID DIALYSIS HAND GRIP STRENGTH MEASUREMENT

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Aim: To determine the reliability, reproducibility and agreement of HGS values pre and mid dialysis.

Background: Handgrip strength (HGS) is a marker of protein-energy status in people on haemodialysis (HD). Best practice guidelines recommend measuring HGS prior to dialysis, which is not always possible. No previous research has compared the reliability, reproducibility and agreement of HGS values pre and mid dialysis.

Methods: Participants were recruited from four HD units ($n = 47$). Eligible participants were stable on HD for at least 3 months and not acutely unwell. HGS was measured in triplicate on non-fistula arm before dialysis (pre HGS) and 2 h into dialysis (mid HGS) for three consecutive weeks.

Bland Altman plots were used to determine agreement between pre and mid measures. Linear mixed models were used to determine differences between pre and mid values controlling for confounders.

Results: There were no significant differences in pre HGS measures ($p = 0.34$) nor mid HGS measures ($p = 0.16$) over 3 weeks. HGS measures were significantly higher pre compared to mid ($p = 0.005$) but these differences were not clinically significant (mean difference 0.5 kg (95% CI: 0.06–0.95). Bland Altman plots indicated agreement between pre and mid HGS measures, suggesting no systematic bias in HGS. The influence of confounders (gender, age, dialysis vintage, frailty status, nutritional status, ultra filtration rate, degree of fluid overload, diabetes and weight) on the differences between pre and mid measures were not statistically significant.

Conclusion: This study found that HGS taken at either pre or mid dialysis were reliable and reproducible. Given the agreement between pre and mid HGS measures, HGS measured mid dialysis may be used for nutritional assessment of HD patients, when baseline measurements are taken mid dialysis.

PAEDIATRICS

AN ELECTRONIC MEDICAL RECORD AUDIT OF URINARY TRACT INFECTION FOLLOWING MICTURATING CYSTOURETHROGRAM IN THE NEONATAL INTENSIVE CARE UNIT

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Aims: To audit the frequency, microbiology and antibiotic prophylaxis (APx) of micturating cystourethrogram associated urinary tract infections (MCUG-UTI's) in a quaternary neonatal intensive care unit (NICU).
Background: Prescription of APx is established practice for infants undergoing MCUG. However, neonates with severe congenital uropathy are very poorly represented in existing literature. In June 2021, we introduced an electronic medical record (EMR) prompt for APx prescription when ordering an MCUG.
Methods: We performed a single centre, retrospective, EMR audit from January 2017 to December 2022. All neonates under 30 days of age undergoing MCUG were included and separated into NICU and non-NICU cohorts. Antibiotic prescriptions, microbiological, biochemical and clinical parameters were collected until 7 days post MCUG.
Results: 138 neonates underwent 140 MCUGs in the audit period. Introducing the EMR prompt increased APx prescriptions from 95% to 100%. No MCUG-UTIs were diagnosed in non-NICU neonates ($n = 70$). There were 10 MCUG-UTIs among 68 NICU patients (14.7%). Four were culture positive (two *Klebsiella* spp, one E. coli and one *Pseudomonas aeruginosa*). Three of the four bacterial isolates were resistant to prescribed APx. The remaining six MCUG-UTIs were in neonates meeting prespecified criteria for culture negative MCUG-UTI. Posterior urethral valve (PUV) was diagnosed in nine of the 10 neonates with MCUG-UTI. Stages 2–3 acute kidney injury ($n = 3$) or escalation of respiratory support ($n = 2$) occurred in 50% of neonates with MCUG-UTI.
Conclusions: This study includes the largest cohort of neonates with PUV undergoing MCUG ever reported. Neonates suspected to have PUV are a high-risk group for APx-resistant MCUG-UTI. Local surveillance of MCUG-UTI sensitivity profiles may guide appropriate APx for this high-risk group. EMR prompting achieved 100% adherence with existing APx protocols.

SCHOOL-BASED SCREENING FOR HIGH BLOOD PRESSURE IN CHILDREN IS EFFECTIVE, ACCEPTABLE AND FEASIBLE

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Aim: To assess the feasibility of conducting a BP screening program.
Background: Elevated blood pressure (BP) or hypertension affects ~15% of children globally and has a significant association with cardiovascular morbidity and mortality in mid-adulthood. However, there is no established pathway for hypertension screening in childhood in Australia.
Methods: One-hundred-ninety-eight children (59% male) in grades 3–6 were recruited from three Melbourne primary schools. BP was manually measured five times in those for whom parental consent was obtained. Those with an average BP >85th percentile or risk factors for high BP had these measurements repeated 2 weeks later, along with 24-hour ambulatory blood pressure monitoring (ABPM). Families and school staff also provided impressions and feedback before and after the program.
Results: Initially, 5.6% and 5.0% had an elevated (>90th percentile) or hypertensive (>95th percentile) BP respectively. Fifty-nine participants (29.8%) were asked to return for the second screening (including 29 with risk factors such as obesity or prematurity, and nine with a BP > 85th percentile but <90th percentile). Fifty-two then completed the second screening and ABPM where five had hypertensive BPs. They, along with three others with inconclusive ABPMs, and three who had elevated/high BPs initially but did not undergo ABPM were referred to a GP. 67% reported that ABPM was tolerable ('bothersome' score < 8/10 for day and/or night). Finally, 96% of families approved of the program and 90% welcomed it as part of their child's schooling.
Conclusions: These preliminary data indicate that a school BP screening program is effective, acceptable and feasible and that measuring BP across multiple occasions, including ABPM, can minimise false positives and therefore burden on individuals and the healthcare system via unnecessary referrals.

PERSPECTIVES OF CAREGIVERS ON ACCESS TO HEALTHCARE FOR CHILDREN WITH CHRONIC KIDNEY DISEASE: A SEMI-STRUCTURED INTERVIEW STUDY

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Aim: To describe caregivers' perspectives on accessing healthcare for children with CKD from socioeconomically disadvantaged backgrounds and/or rural or remote areas.

Background: Inequitable access to health care based upon demographic factors such as ethnicity, socioeconomic status (SES) and geographical location has been consistently found in children with chronic kidney disease (CKD). However, little is known about the perspectives of caregivers on accessing healthcare.

Methods: Caregivers of Australian children aged 0–16 years, across all CKD stages, from low SES backgrounds, and/or residing in rural or remote areas, purposively sampled from five centers, participated in semi-structured interviews on accessing healthcare. Transcripts were analysed thematically.

Results: From 32 interviews, we identified 6 themes: lack of agency undermining ability to seek care (obscurity of symptoms, uncertain and confused about care processes, vulnerable and unable to advocate), losing trust in clinicians (confused by inconsistencies and ambiguities in advice, distressed by lack of collaborative care), exasperated by organisational rigidity (frustrated by bureaucratic roadblocks, lack of access to specialist care in rural and remote settings, inadequacies of support programs), compounding burden of caregiving (unsustainable financial pressure, debilitating exhaustion, and asymmetry of responsibility), intensifying strain on family (uprooting to relocate, sibling stress and neglect, depending on family support), building resilience and stability (empowerment through education and confidence in technical and medical support).

Conclusions: Caregivers of children with CKD from disadvantaged backgrounds feel disempowered and vulnerable when accessing care for their child. Strategies are needed to improve access to healthcare for families who are socioeconomically or geographically disadvantaged.

KIDNEY TRANSPLANT BIOPSY ADEQUACY AND OUTCOMES IN CHILDREN

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Background: Percutaneous kidney transplant biopsies contribute to the diagnosis of transplant dysfunction and obtaining adequate tissue is crucial. Studies comparing biopsy outcomes according to technique or proceduralist are limited in the paediatric population, and report variable outcomes.

Aim: To compare the adequacy and complication rates of kidney transplant biopsy samples between interventional radiologists (IR) utilising the tangential approach and paediatric nephrologists (PN) using the perpendicular approach.

Method: Retrospective clinical, demographic and procedural data were analysed from the electronic medical records of kidney transplant recipients undergoing an allograft biopsy between January 2008 and December 2023.

Results: Of 188 included biopsies, 100 (53%) were performed by IR and 88 (46%) by PN. The median number of cores obtained was 2.4 (IQR: 2–3). Overall 132 (71%) of biopsies were adequate according to Banff criteria. The proportion of adequate samples was significantly higher in IR-performed biopsies (IR = 89% vs. PN = 49%, $X^2 = 36.8$, $p < 0.001$). The median number of glomeruli obtained was 18 (IQR: 10–30) with a significantly higher number present in IR-obtained samples (median: IR = 26 vs. PN =11, $p < 0.001$). A diagnosis was possible in 184 samples (97.9%) irrespective of the adequacy. There was

no statistically significant difference in rates of macroscopic haematuria (IR: $n = 9$, 9%, vs. PN: $n = 12$, 14%, $p = 0.3$) or perinephric haematomas (IR: $n = 7$, 7%, vs. PN: $n = 7$, 8%, $p = 0.8$). One patient required a blood transfusion post-biopsy, and there were no biopsy-related infections or arterio-venous fistulas.

Conclusion: There was an overall adequacy rate of 71% with significantly higher adequacy in IR-performed biopsies. There were low rates of complications with no significant difference in rates between proceduralists.

GLOMERULAR BASEMENT MEMBRANE MORPHOLOGY IN CHILDREN WITH IGA NEPHROPATHY

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Aims: To determine the occurrence of glomerular basement membrane (GMB) abnormalities in a paediatric (1–16 yrs) cohort with biopsy-proven IgAN, and compare differences in demographics, presentation, biopsy findings and clinical outcomes in patients with and without GBM changes.

Background: IgA nephropathy (IgAN) in childhood is a histological diagnosis based on characteristic features of mesangial proliferation and predominant IgA immune complex deposition. Differential diagnosis includes Alport syndrome (AS). Previous studies have reported GBM abnormalities in IgAN that are similar to those seen in Alport syndrome but this has not been well reported in a paediatric cohort.

Methods: Existing data from 43 patients who underwent native kidney biopsies from 2013 to 2022 from within the Sydney Children's Hospitals Network were collected and analysed. Statistical analysis included independent t-tests, Mann–Whitney *U* and Chi-squared tests, whilst Kaplan Meier 10-year hazard and univariate Cox hazard models were used to assess differences in follow-up outcomes between the groups.

Results: 63% patients (27/43) had GBM abnormalities on electron microscopy. Of these, 74% were male and 26% were female, with a median (IQR) age of 12 (7–14) years. Demographics and clinical data at presentation were comparable, however, biopsy MEST-C scores showed higher crescent formation in patients with GBM abnormalities ($p < 0.01$). These patients were also 70% less likely to achieve disease remission, defined as absence of proteinuria/albuminuria at follow-up (HR 0.324, 95% CI, 0.104–1.011, $p = 0.05$).

Conclusions: GBM changes in paediatric IgAN patients is common and mimic those found in AS. They are associated with a worse outcome and raise the possibility of a combined nephropathy. We propose consideration of sequencing of Alport-associated genes and reconsideration of IgAN as the primary diagnosis in these patients.

PERITONEAL DIALYSIS

ASSISTED PERITONEAL DIALYSIS PROGRAM USING NON-REGISTERED NURSE HEALTHCARE STAFF

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Aims: To describe the development, feasibility and outcomes of a staff-assisted peritoneal dialysis (PD) program in the United States (US).

Background: Assisted peritoneal dialysis (PD), using non-registered nursing staff, can help overcome barriers to self-care. However, feasibility and regulatory concerns have prevented assisted PD uptake in the US and other regions.

Methods: Non-registered nurse healthcare staff were trained on PD procedures and troubleshooting common problems. The program was available at 16 home dialysis training centres. We captured referral indications, required services, logistic elements of program delivery, and patient outcomes for patients discharged by end of April, 2023.

Results: 121 patients were referred to the program. Indications for referral were physical function limitations, cognitive impairment, and psychosocial challenges (57%, 47%, and 46% respectively). Staff assistance was provided for 73 patients (65 distinct patients; 8 referrals were re-enrolments post discharge). Mean age was 71 (SD 14) years. A total of 604 visits were delivered (median 5 (IQR 3–10, range: 1–49 visits). Median duration for a patient on the program was 8 (IQR: 2–21) days. Assistance was primarily needed for setup of PD, organisation of home consumables storage and observation of aseptic technique. No peritonitis events or exit-site infections were reported. There were 10 hospitalizations, none related to assisted PD. 68 patients (93%) were discharged on PD without staff assistance, two transferred to in-centre haemodialysis, and three patients died (unrelated to assisted PD). The 6- and 12-month PD survival in this cohort was 70% and 59% respectively.

Conclusions: Staff-assisted PD for limited time periods is operationally feasible with non-registered nurse healthcare staff in the United States and can support transitioning and maintaining patients on PD.

MICROBIOLOGY OF PROCEDURE RELATED PD-PERITONITIS FOLLOWING GASTROSCOPY AND COLONOSCOPY: A BINATIONAL DATA-LINKAGE STUDY

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Aim: To describe the microbiology of post-procedural peritoneal dialysis (PD) peritonitis episodes following gastroscopy and colonoscopy over a 15-year period.

Background: The risk of post-procedural PD peritonitis is well recognised following colonoscopy and current ISPD guidelines recommend prophylactic antibiotics. Current guidelines do not recommend this prior to gastroscopy alone due to low level evidence.

Methods: Data linkage between hospital admission datasets and ANZDATA was performed in all jurisdictions across Australia and New Zealand to identify all registered PD patients who underwent either gastroscopy or colonoscopy. ANZDATA reporting of peritonitis was interrogated to identify cases that occurred within seven days of endoscopy.

Results: There were 4433 admissions (3674 unique patients), of which 2447 were for gastroscopy, 1191 for colonoscopy and 795 for both procedures. Peritonitis within 7 days of these procedures occurred in 51 (2.1%), 24 (2%) and 24 (3.2%), respectively. There were 43 episodes of monomicrobial infection following gastroscopy, of which 44% were not reported or culture negative. Coagulase negative staphylococci (6/43), enterococcus (3/43) and E. coli (3/43) were the most common organisms identified. Post-colonoscopy, there were 24 monomicrobial infections, of which 50% were culture negative or not reported, and most of the remainder were E. coli (7/24). There were 15 episodes of polymicrobial infection, 8 of which were following gastroscopy. Common organisms isolated in polymicrobial infection, regardless of scope type, included coagulase negative staphylococci, E. coli, Klebsiella Sp and fungi (33% polymicrobial peritonitis episodes).

Conclusions: Mono- and poly-microbial peritonitis episodes (including gram negative and positive organisms) are not infrequent following both gastroscopy and colonoscopy. This has implications for current ISPD guideline recommendations.

FREQUENCY OF THERAPY ALERTS DURING THE FIRST 30 DAYS OF AUTOMATED PERITONEAL DIALYSIS AND ITS RELATIONSHIP TO TECHNIQUE SURVIVAL

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Aim: Investigate the relationship of automated peritoneal dialysis (APD) alerts in the first 30 days with subsequent technique survival.

Background: Therapy alerts during APD can cause significant disruption to patients' sleep and quality of life. Following probabilistic linkage of the Baxter Claria Sharesource database to the ANZDATA registry, we examined the relationship of therapy alarm frequency with the risk of technique failure.

Methods: We included all adult patients in Australia and New Zealand who commenced APD with the Baxter Claria device over 2019–2022 and continued for at least 30 days ($N = 1154$). We calculated the average number of therapy alerts per treatment in the first 30 days and divided the cohort into two groups: <1 alert per night ($N = 490$) or ≥1 alert per night for the first 30 days ($N = 664$). We examined (for the subsequent 3 years): overall technique failure and death censored technique failure due to infection. Analyses used Cox regression and competing risk regression for infective technique failure.

Results: Higher rates of technique failure were seen in the group with a higher initial alert rate, with 30.6% of patients in the high alert group stopping PD within 3 years compared to 28.0% in the low alert group. The hazard ratio (HR) for overall technique failure for the high-alert group was 1.61 (95% CI: [1.30, 2.00]), and 1.45 [1.14, 1.84] when adjusted for covariates. The HR for infective technique failure was 1.58 [1.16, 2.15] and 1.47 [1.04, 2.08] when adjusted for covariates.

Conclusions: Early experience on PD is an important predictor of long-term outcomes. Averaging more than 1 alert in the first 30 days of treatment is associated with a higher risk of technique failure within 3 years.

TEMPORAL ASSOCIATION OF PERITONEAL DIALYSIS PERITONITIS RATES AND OUTCOMES WITH COVID-19 PANDEMIC ONSET IN AUSTRALIA: A REGISTRY ANALYSIS

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Aim: To compare peritoneal dialysis (PD) peritonitis rates and outcomes before and after COVID-19 pandemic onset in Australia. A secondary objective was comparison of incident PD patient characteristics.

Background: Effective hand hygiene is recommended to prevent PD-peritonitis. It is unclear whether the COVID-19 pandemic and ensuing self-reported improvements in hand hygiene were associated with improved PD-peritonitis rates and outcomes.

Methods: The study included patients on PD in Australia between 1/1/2015 and 31/12/2022, as recorded by the Australia and New Zealand Dialysis and Transplant Registry. PD-peritonitis rates and outcomes were analysed before COVID-19 onset (1/1/2015–10/3/2020) and after COVID-19 onset (11/3/2020–31/12/2022). COVID-19 onset was defined using the WHO worldwide pandemic date (11/3/2020). Characteristics of incident patients commencing PD before and after COVID-19 onset were also analysed.

Results: Of 11 499 patients who received PD, 3236 patients (28.1%) commenced PD after COVID-19 onset and 8263 (71.9%) before. Compared with the pre-COVID-19 era, the post-COVID-19 era was associated with lower peritonitis rates (0.30 [95% CI 0.29–0.31] vs. 0.35 person-years [95% CI 0.34–0.36]; $p < 0.001$), fewer PD-peritonitis-related hospital admissions (67.1% vs. 71.5%, $p < 0.001$), fewer PD-peritonitis-related PD catheter removals (16.3% vs. 20.5%, $p < 0.001$) and fewer PD-peritonitis-related haemodialysis transfers (13.1% vs. 17.6%, $p < 0.001$).

There was no difference in: age at dialysis initiation (median 60 years [IQR 47–70] vs. 60 [IQR 47–70], $p = 0.59$), diabetes (44.8% vs. 46.1%, $p = 0.23$), cardiovascular (27.3% vs. 28.1%, $p = 0.46$) or lung disease (10.4% vs. 11.5%, $p = 0.13$) in incident patients after COVID-19 onset compared with the pre-COVID-19 cohort.

Conclusions: Onset of COVID-19 was associated with improved PD-peritonitis rates and outcomes in Australia, with no difference in age at dialysis initiation and diagnoses of diabetes, cardiovascular or lung disease.

COST ANALYSIS OF EARLY START PERITONEAL DIALYSIS VERSUS HAEMODIALYSIS

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Aim: To compare the costs of commencing peritoneal dialysis (PD) under various clinical scenarios.

Background: Early-start PD is increasingly implemented to reduce risks associated with starting haemodialysis via central venous catheter, but the cost has not been analysed.

Methods: Patients with kidney failure commencing PD from August 2019 to August 2022 were retrospectively included. Patients were categorised depending on in- or out-patient status when starting dialysis, 'early-' or 'conventional-'start PD (≤14 or >14 days of catheter insertion) and for those initiated on haemodialysis (HD), as PD catheter insertion before or after 2 weeks of HD commencement. Costs were calculated in Australian dollars using the Australian Refined Diagnosis Related Groups. Total costs were calculated from the time of first dialysis (PD or HD) to when independence was achieved with PD.

Results: 290 patients (71% male, mean 59 years) were included with 220 on PD and 63 converting from HD (incomplete data $n = 7$). Of patients who commenced maintenance dialysis as inpatients, costs for early-start PD ($n = 15$) achieving independence after 12 days (median, IQR = 14) were $51 576 (mean, SD = 46 327). The cost for HD patients converting to PD within 2 weeks ($n = 5$) achieving independence after 38 days (median, IQR = 9) was $83 692 (mean, SD = 50 103). If conversion occurred after 2 weeks (n = 43), the costs for patients achieving independence after 97 days (median, IQR = 102), requiring 18 (median, IQR = 46) incentre/satellite dialysis sessions, was $84 309 (mean, SD = 88 604). HD patients who convert to PD spent an average of 43 days in hospital (SD = 36) versus 15 days (SD = 8) for early-start PD patients.

Conclusions: Early-start PD is associated with lower costs for suitable incident dialysis patients requiring inpatient commencement of dialysis while also achieving a rapid transition to home-based therapy.

EXPLORING THE ASSOCIATION OF SEX/GENDER DISPARITIES WITH ALL-CAUSE AND CAUSE-SPECIFIC PERITONEAL DIALYSIS DISCONTINUATION: A MULTIPLE MEDIATION ANALYSIS

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Introduction: Little is known about sex/gender differences in cause-specific peritoneal dialysis (PD) discontinuation. We aimed to assess the mediating effects of sociodemographic factors and comorbidities on the association between sex/gender differences, all-cause and cause-specific PD discontinuation.

Methods: Incident patients starting PD between 2005 and 2019 were identified using the ANZDATA registry. Adjusted Cox proportional hazards models were used to determine the association between sex/gender and all-cause (transfer to haemodialysis for ≥30 days or death), inadequate dialysis-related and infection-related PD discontinuation. Counterfactual mediation analysis was conducted to decompose the total effects of sex/gender on all-cause and cause-specific PD discontinuation, into direct and indirect effects, adjusting for mediator-exposure and mediator-outcome confounders.

Results: 6001 out of 9748 included patients experienced all-cause PD-discontinuation (2098 died, 813 inadequate dialysis-related, 1510 infection-related). In the adjusted Cox model (HR, 95%CI), men were more likely to experience all-cause (1.08, 1.03–1.14, $p = 0.002$) and inadequate dialysis-related PD discontinuation (1.68, 1.48–1.95, $p < 0.001$), but not infection-related PD discontinuation (0.93, 0.83–1.03, $p = 0.14$). The mediation analyses found that men were more likely to experience all-cause PD discontinuation (1.08, 1.02–1.14, $p = 0.012$). 72% of the total effect was explained by mediators, including cardiovascular disease (47.5%), smoking status (23.2%) and diabetes (16.9%). Men were more likely to experience PD discontinuation due to inadequate dialysis (2.39, 1.05–5.75, $p = 0.038$), however, only 5.6% of the total effect was explained by mediators.

Conclusion: Men were more likely to experience all-cause and inadequate dialysis-related PD discontinuation than women. The effects of sex/gender on all-cause PD discontinuation, were mediated by CVD, smoking status and diabetes. Future studies may consider evaluating these intermediate markers as potential modifiable factors in clinical trials involving patients undergoing PD.

QUALITY INDICATORS

CONSUMER-PRIORITISED QUALITY INDICATOR OUTCOMES IN KIDNEY FAILURE CARE

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Aim: To determine the importance of various quality indicators of kidney failure care to people with lived experience of kidney disease.

Background: The Australia and New Zealand Dialysis and Transplant Registry (ANZDATA) publishes reports that compare units on their quality of care. There is little knowledge of the importance of various quality indicator outcomes in dialysis and transplant care according to consumers.

Methods: An online survey of consumers was conducted from August 2023 to April 2024. Participants were asked about the importance of seven quality indicators in the areas of dialysis and kidney transplantation that are currently reported by ANZDATA (dialysis patient survival, haemodialysis access at initiation, timely referral to nephrologist [three or more months prior to first kidney replacement therapy (KRT)], access to transplantation, transplant patient survival, graft survival and peritonitis infection rates).

Results: 243 consumers (55% kidney transplant recipients, 31% receiving dialysis) responded about the importance of at least one of the quality indicators. The mean age of respondents was 59 years (SD 13y) and 50% were female.

Access to transplantation was rated the most important quality indicator overall (71% responded important or higher), with importance of other indicators in descending order being: graft survival (61%), transplant patient survival (55%), timely referral (52%), dialysis patient survival (49%), peritonitis infection rates (43%) and haemodialysis access at initiation (38%). Access to transplantation was rated the most important quality indicator among kidney transplant recipients, people receiving dialysis and people with kidney disease not receiving KRT.

Conclusions: Consumer-prioritised quality indicators will be used to inform consumer-friendly reporting. Kidney units should appreciate the importance of access to transplantation to consumers and prioritise efforts to improve in this metric.

TRANSPLANTATION

IDENTIFYING FACTORS LINKED TO NON-TRANSPLANTATION IN THE DIABETIC KIDNEY DISEASE POPULATION IN TARANAKI, NEW ZEALAND—A 10 YEAR AUDIT

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Aim: Compare demographics of transplant candidates (TC) vs non-transplant candidates (NTC) with diabetic kidney disease (DKD); identify duration of TC workup phases and reasons for non-transplant.

Background: Kidney transplants (KT) constitute 54% of Taranaki's renal replacement therapy population, however, the proportion of

DKD patients receiving KT 2017–2022 was significantly below national average (6.7% vs. 21%).

Methods: Data were retrospectively retrieved for 1/1/2013–1/1/2023. For all patients, demographics and for TC, CKD-5 onset to start of workup (phase 1), start of workup to first listing (phase 2), first listing to transplant (phase 3), current workup status and reason for suspension were collected.

Results: Comparing TC ($n = 28$) to NTC ($n = 52$), mean age in years (95%CI) 57.9 (3.8) vs. 66.3 (2.3) $p = 0.0002$; males 57.1% vs. 63.5%, females 42.9% vs. 36.5% $p = 0.58$; mean BMI 34.1 (2.3) vs. 34.0 (1.8) p = 0.94; Māori 64.2% vs. 46.2%, NZ European 28.6% vs. 50%, Other 7.1% vs. 3.8% $p = 0.17$; T1DM 17.9% vs. 3.8%, T2DM 82.1% vs. 96.2% $p = 0.03$; mean ACE-r 88.3 (3.3) vs. 82.0 (3.4) $p = 0.02$; living alone 14.3% vs. 17.3% $p = 0.68$ and mean distance to RU in km 40.1 (11.7) vs. 29.3 (8.2) $p = 0.14$. Mean time in months (95%CI) for TC in phase 1: 2.0 (1.5), phase 2: 21.6 (7.5) and phase 3: 2.5 (0.7). 85.7% of TC were delayed, suspended or completing workup; 7.1% waitlisted and 7.1% transplanted. Of 17 TC suspended, 35.3% were patient-led/adherence, 23.5% cardiac-related, 17.6% incidentalomas and 23.5% other.

Conclusions: DKD TC were typically younger, Māori with higher ACE-r scores than NTC. For TC, phase two was longest with a minority waitlisted or transplanted. Suspensions were mainly patient-led/adherence or cardiac-related. Our findings will help tailor strategies to increase DKD transplantation.

NON-RETRIEVAL AND NON-UTILISATION OF DECEASED DONOR KIDNEYS FOR TRANSPLANTATION: AN AUSTRALIAN COHORT STUDY

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Background: An efficient organ procurement program must maximise utility of retrieval team activity.

Aims: To quantify non-retrieval and non-utilisation rates of deceased donor kidneys.

Methods: We conducted a cohort study of deceased kidney donors in Australia 2014–2021 using ANZOD data. Outcomes were non-retrieval (kidneys not retrieved after surgical incision) and non-utilisation (kidneys retrieved but not transplanted). We compared non-retrieval and non-utilisation rates using logistic regression by donor factors (age, sex, blood-group, ethnicity, BMI, smoking, socio-economic disadvantage, remoteness, year, cause of death, resuscitation, pathway, KDPI, side, and dual-allocation/en-bloc), and system factors (state/territory of donor hospital, retrieval team, and intended recipient's hospital).

Results: Among 7211 kidneys (3812 donors) intended for transplantation, 675 (9%) were non-retrieved and 430 (7%) were retrieved but non-utilised. The non-retrieval rate doubled from 5% in 2014 to 10% in 2021 ($p = 0.01$), whereas non-utilisation remained around 7% annually ($p = 0.1$). Non-utilisation rates were lower for donor hospitals in Tasmania (2.3%) and Queensland (3.4%) compared to other states/territories (average 7.5%, $p < 0.001$), and for retrieval teams from Queensland (3.4%) compared to other states/territories (average 7.3%, $p = 0.004$). Factors associated with non-retrieval were KDPI ≥75% for standard criteria donors (OR 3.14, 95%CI: 1.84–5.36) and extended criteria kidneys (OR 3.27, 95% CI: 1.99–5.35, $p < 0.001$), diabetes (OR 1.68, 95%CI: 1.31–2.15, $p < 0.001$) and history of cancer (OR 1.33, 95% CI: 1.01–1.75, $p = 0.04$). Factors associated with non-utilisation were DCDD (OR 1.96, 95% CI: 1.49–2.57, $p < 0.001$), history of cancer (OR 1.49, 95% CI: 1.07–2.05, $p = 0.02$) and older age (OR 1.26, 95% CI: 1.09–1.46, $p = 0.002$). Reasons for non-utilisation included perfusion issues (17%), however most reasons documented lacked transparency.

Conclusions: Efforts to maximise transplantation of donor kidneys could focus on improving utilisation of higher KDPI kidneys and perfusion techniques.

IMPLEMENTATION AND EVALUATION OF A COMPREHENSIVE RENAL TRANSPLANTATION PREHABILITATION ALLIED HEALTH MODEL OF CARE

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Aim: Implement a pilot allied health prehabilitation allied health service for adults preparing for kidney transplantation and evaluate feasibility and acceptability.

Background: Comprehensive multidisciplinary assessment and treatment is recognised to optimise outcomes in renal transplant recipients. Pilot prehabilitation studies have shown feasibility, positive physical outcomes and satisfaction.

Methods: A pilot allied health model of care was implemented at a metropolitan health service in Melbourne, Australia from December 2023 to patients preparing for transplantation. Assessment and targeted interventions were provided by a Physiotherapist, Dietitian, Social Worker and Neuropsychologist. Data on number of referred patients assessed and appointment attendance were collected. Patient outcomes were measured at baseline and 3 months for frailty using the Fried Frailty Score, malnutrition using the PG-SGA and quality of life with the KD-QOL. Acceptability surveys informed by the Theoretical Framework of Acceptability were conducted. Data were analysed using descriptive statistics.

Results: Of 40 patients referred, 84% were assessed or assessment scheduled, with high appointment attendance (face-to-face 98%; telehealth 92%). Allied Health assessments detected frailty (frailty 18%, pre-frailty 43%), malnutrition (moderate 53%, severe 3%) poor quality of life (KD-QoL < 50% 66%) with targeted interventions provided by Physiotherapy (50%) Dietitian (92%), Social Work (27%) and Neuropsychology (33%).

In small patient numbers ($n = 8$), improvements were seen at 3 months, with 38% having better frailty scores, 38% no longer malnourished and no deterioration in KD-QOL scores. Of 19 patients who completed the survey, all rated the pilot as acceptable (Acceptable 74%, Completely Acceptable 26%).

Conclusion: Evaluation of the pilot AH model of care indicates that it is feasible. Further evaluation of objective measures and acceptability and feasibility of the model is underway to guide future service development.

SEX AND GENDER AS PREDICTORS FOR ALLOGRAFT AND PATIENT-RELEVANT OUTCOMES AFTER KIDNEY TRANSPLANTATION: A PROGNOSTIC REVIEW

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Aim: To assess the association between recipient sex and gender and patient relevant outcomes after kidney transplantation.

Background: Sex, a biological determinant, and gender, encompassing sociocultural attitudes, may affect post-transplant outcomes. However, the effects of recipient age and donor sex on this relationship remained unclear.

Methods: A systematic search of MEDLINE and EMBASE databases was conducted up to April 12, 2023. Allograft loss, death, cancer, and allograft rejection were the outcomes of interest. Random-effects meta-analyses were performed when appropriate to estimate the mean differences.

Results: This review included 53 studies (2 144 613 patients with 54%-male). There were minimal differences in kidney allograft loss between females and males across all analyses (7 studies, 9746 patients: RR 0.89, 95% CI 0.77–1.04, $I^2 = 56\%$) (6 studies, 238, 937 patients; HR 1.07, 95% CI, 0.95–1.20, $I^2 = 44\%$). Studies considering recipient age and donor sex showed higher rates of allograft losses in female recipients under 45 years with male donors. There were minimal differences in all-cause death after transplantation between males and females (13 studies, 62, 530 patients; RR 0.90, 95% CI 0.78–1.05, $I^2 = 91\%$). Studies considering recipient age and donor sex showed higher excess mortality risk in females under 45 years with male donors. No differences between males and females were observed in cancer incidence or allograft rejection.

Conclusion: This study suggests, with low certainty, that there are little differences in allograft loss, death, cancer, and rejection between male and female transplant recipients. However, the influences of recipient age and donor sex on the association between sex and gender on post-transplant allograft outcomes and death should be considered in post-transplant care.

A MULTI-NATIONAL SURVEY ON CURRENT PRACTICE, BARRIERS AND NEEDS FOR IMPLEMENTING MYCOPHENOLATE DOSE OPTIMIZATION IN KIDNEY TRANSPLANTATION

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Aim: To assess current immunosuppressant practice in kidney transplantation in India and Australasia, with focus on mycophenolate dosing strategy.

Background: Short-term outcomes in kidney transplantation have improved substantially over time, however long-term outcomes, including early graft attrition and cumulative toxicities, remain a significant burden. Concentration-controlled dosing (CCD) increases the safety and efficacy of critical-dose drugs. There has been a re-emergence of interest in CCD for mycophenolate mofetil (MMF).

Method: A multi-national survey on current immunosuppressant regimen and mycophenolate dosing strategy in kidney transplantation, via online questionnaire distributed to nephrologists across India, Australia, and New Zealand.

Results: Responses from 142 transplant clinicians, 111 from India and 31 from Australasia, were analysed. The predominant induction agent used was anti-thymocyte globulin (ATG) in India (54%), basiliximab in Australia and New Zealand (82%). Overwhelmingly, maintenance therapy was with tacrolimus (97.9%), MMF (78.2%), and corticosteroid continuation (95.8%).

Mycophenolic acid (MPA) concentration monitoring was never performed in 78% of respondents, including 90% of those from India. For those that never measure MPA, major reasons were practical difficulties in attaining MPA concentrations (55.5%), cost (32.7%) and unclear guidance on AUC0-12 estimation technique (35.5%). Only 10.9% of respondents who never measured MPA questioned clinical benefit.

Conclusion: Whilst fixed dosing of mycophenolate remains prevalent, particularly in India where access and cost were significant concerns, only a minority of respondents questioned clinical benefit of mycophenolate CCD. Nevertheless, there remains a gap in understanding of the various AUC estimation techniques, and in practical aspects of MPA optimization including AUC0-12 estimation techniques and optimal exposure targets alongside contemporary immunosuppressant regimen.

IMPLEMENTATION OF THE VIRTUAL CROSSMATCH (VXM) IN AUSTRALIA FOR DECEASED DONORS AND KIDNEY TRANSPLANT WAITLIST RECIPIENTS

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Background: For over 40 years, Complement Dependent Cytotoxicity (CDC) crossmatching, was the final test used for assessment of compatibility of kidney donors kidney and a potential transplant recipient. Due to limited reagent supply, national phase-out began in 2022, fully transitioning to virtual crossmatching (VXM) by 2023.

Method: VXM utilises the assignment of patients Unacceptable (UA) HLA antigens, based on HLA antibodies (HLA-Ab) > 2000/4000MFI, and the Kidney Matching algorithm in OrganMatch to enable compatible patients to offered kidneys. Final assignment of donor specific HLA-Ab (DSA) using Luminex Single Antigen Bead HLA-Ab tested within 3 months. A retrospective Flow crossmatch (FXM) is available for highly sensitised patients or urgent cases.

Aim: Review of 12 month period, from 1st January 2023 to assess results and adverse events associated to the change in testing practise.

Results: Of 772 patients transplanted, 67.9% were unsensitised and 32.1% sensitised (13.6% mPRA 1%–50%, 4.9% mPRA 50%–80%, 3.9% mPRA 80%–95%, 4.1% mPRA 95%–98%, and 5.6% 99%–100%. 54/772 patients transplanted across DSA on current sera, 22 FXM performed, only 6 FXM positive results (patient 1 HLA-C*08:01 (MFI 4122) FXM T-B+, patient 2 HLA A*26:01 (MFI 2618) T + B+ FXM, patient 3 HLA DRB1*10:01 (MFI 1591) FXM T-B+, patient 4 HLA B*08:01/C*07:02 (MFI 3871/4191) FXM T-B+. patient 5 HLA DRB1*07:01 (MFI 1818) FXM T-B+, patient 6 HLA*DRB1*12:02/DRB1*12/B*44:03/B*44:02 (MFI 2987/2487/2734/1527) FXM T-B+. In 2023, 96/1275 kidney offers were declined by the due to DSA, compared to 119 in 2022. There was one graft loss due to renal artery thrombosis reported.

Conclusion: Confidence in the new process is evident through low decline rates and flow crossmatch requests, showing acceptance in the HLA antibody screening, DSA assignment and VXM.

ACCESS TO KIDNEY TRANSPLANT WAITLISTING FOR PEOPLE WITH MENTAL ILLNESS; A COHORT STUDY IN NSW

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Aims: To describe whether people with prior mental health service (MHS) use experienced delayed access to waitlisting for kidney transplantation compared to other NSW residents.

Methods: ANZDATA linked with NSW administrative datasets from the Mental Health Living Longer cohort were used including all adult patients on dialysis in NSW, 2006–2020. Rates of prior MHS contact were described, and a subgroup with evidence of severe and persisting mental illness (SPMI) defined. Time to waitlisting from start of dialysis was estimated using Kaplan–Meier estimates.

Results: Of 11 536 patients, 2089 (18.2%) were identified as MHS users, including 641 (5.6%) with SPMI, and 1448 (12.6%) with other MH conditions. Pre-existing MHS use was observed for 531 (82.8%) of the SPMI group and 820 (56.6%) other MHS users. Females comprised a higher proportion of the SPMI group (41.2%) compared to the other MH (36.1%) and no MHS use (36.1%) groups. MHS users were younger (SPMI median age 54 (IQR 45–64), other MH 60 (IQR 47–69)) than those without MHS use (65 years (IQR 54–74)). Overall, 22.1% of the cohort achieved waitlisting, comprising of 22.3% of non-MHS users, 20.5% of SPMI and 20.1% of other MHS users. Proportion on the waitlist within 6 and 12 months of dialysis, respectively, was 6.2% (95% CI

5.7–6.7%) and 12.4% (95% CI 11.7–13.1) for non-MHS users, 4.3% (95% CI 2.9–6.4) and 8.0% (95% CI 5.90–10.8) for SPMI MHS users, and 8.0% (95% CI 6.3–10.2) and 13.9% (95% CI 11.6–16.7) for other MHS users.

Conclusions: Preliminary results suggest delayed access to the kidney waitlist for people with SPMI, compared to those without MHS use. Coordinating mental health and kidney services may reduce inequities in accessing kidney care for people with mental illness.

DECISION SUPPORT TOOL TO AID RISK ASSESSMENT OF ACCEPTING VERSUS DECLINING A KIDNEY OFFER FROM A DONOR WITH A RISK OF DISEASE TRANSMISSION

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Aim: To develop a decision support tool for patients and clinicians comparing consequences of accepting versus declining a kidney offer from a deceased donor with cancer or blood-borne virus (BBV) transmission risk.

Background: The decision to accept a kidney from a donor with history of cancer/BBV involves complex assessment of the risk of acceptance versus remaining on dialysis. Transplant clinicians and patients would benefit from tools to aid this decision-making.

Methods: Transmission risks by cancer type and BBV serology were based on TSANZ guidelines and published literature. We supplemented the NSW biovigilance register (SAFEBOD) with Australia-wide data from ANZDATA/ANZOD to model outcomes from declining a kidney offer including time to next/better offer and waitlist suspension. Models were adjusted for age, sex, blood-group, sensitisation, state/territory, previous transplants, comorbidities, kidney disease, dialysis time, and kidney failure time. Time to cancer and death were based on AIHW cancer data, ABS life tables, and published standardised cancer incidence and mortality ratios in kidney failure. A tool interface was developed using the R package 'shiny'.

Results: A web-app visualising expected outcomes, available here: http://tiny.cc/pr12yz. For example, for a hypothetical patient (50y, male, blood-group B, sensitisation 80%, NSW resident, glomerular disease, transplant-naive, 2-years dialysis) offered a kidney from a 45y male DBD donor (KDPI 31%, glioblastoma), cancer transmission risk is 2%. If declined, median waiting time is 1.6 months (any offer) or 7.2 months (KDPI <31%), with chance of waitlist suspension (20%), cancer (0.4%) or death (3.4%) while waiting.

Conclusions: A bespoke visualisation of expected outcomes and risks of remaining on dialysis may enable informed decision-making and better patient outcomes.