Oral presentations

OP-01 Kinetic glomerular filtration rate as a predictor of acute kidney disease

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Introduction. Acute kidney injury (AKI) remains an important factor for mortality and morbidity among the adult population. Several biomarkers are being used to evaluate AKI, AKI duration, and AKI outcomes. The kinetic estimated glomerular filtration rate (KeGFR) formula developed by Chen is a valuable tool used in predicting AKI occurrence in patients admitted to intensive care units. The aim of our study focuses of the utility of the KeGFR formula to estimate AKI duration and mortality when applied in the first 24 hours of AKI diagnosis.

Methods. We performed a retrospective observational cohort study on 103 patients diagnosed with AKI, admitted to the Nephrology Department of "Pius Brinzeu" Emergency County Hospital from Timisoara during January-February 2024. The inclusion criteria was the recording of at least two serum creatinine values within 24 hours of AKI diagnosis. We recorded age, gender, and associated diseases. We identified several factors associated with acute kidney disease (AKD) development. We evaluated the impact of KeGFR on AKI duration and mortality.

Results. 65 patients developed a prolonged AKI episode and were diagnosed with AKD. Patients with AKD presented similar age (71 years), sex distribution (39.8% males), arterial hypertension (91.3%), diabetes mellitus (43.77%), neoplasia (11.7%) and sepsis (40.8%), but presented higher incidence of CKD (76% vs 52%, p=0.023) and heart failure (63.1% vs 42.1% p=0.039). Regarding biological parameters, AKD patients presented lower haemoglobin levels (10.96 vs 12.11 g/dl p=0.008), higher phosphate (4.4 vs 3.5 mmol/l p=0.0129), and higher parathormone levels (131.2 vs 93.95 pg/ml p=0.021). AKD patients had higher baseline serum creatinine levels (1.5 vs 1.15 mg/dl p=0.028), translated into lower baseline eGFR (35 vs 51.5 ml/min/1.72sm p=0.041). AKD patients presented lower levels of KeGFR (16.19 vs 32.71 ml/min/1.73sm, p=0.001), longer hospital stay (12.4 vs 6.7 days, p<0.001), and similar mortality compared to non-AKD patients (18.4%). Independently, each unit decrease in KeGFR translated into a 4% higher chance (OR=0.96, 95%CI=0.93-0.98, p=0.0039) of a patient developing AKD.

Conclusion. KeGFR evaluation on the first day of AKI could become a useful tool in predicting AKI duration, regardless of comorbidities or AKI cause. The impact of this simple equation can lead to better and earlier AKI management, especially in the intensive care units.

OP-02 Dynamic clinical and biochemical predictors of acute kidney injury in trauma ICU Patients: Insights from preliminary results of a cohort

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Introduction. Acute kidney injury (AKI) is a frequent and severe complication in trauma intensive care unit (ICU) patients, substantially worsening survival. While contributors such as hemodynamic instability, nephrotoxic exposure, and illness severity are recognized, early predictive tools remain scarce. Classical markers, such as serum creatinine, rise only after significant renal damage. This study investigates risk factors and early detection markers of AKI in trauma ICU patients at the University Hospital of Trauma, Albania.

Methods. We conducted a prospective observational study of 153 adult trauma ICU patients (May 2024–August 2025). Clinical characteristics, exposures, and dynamic laboratory values were collected over a 14-day period. KDIGO criteria staged AKI. Logistic regression and ROC analyses were used to assess predictors of AKI and associated mortality. This report reflects interim data; enrollment will continue until December 2025 to refine biomarker validation.

Results. AKI developed in 53.6% of patients (Stage I: 31, Stage II: 23, Stage III: 28). Mortality increased with severity: 31% in no AKI, 68% in Stage I, 52% in Stage II, and 100% in Stage III. AKI conferred a >5-fold mortality risk (74% vs 34%; OR, 5.5; p < 0.000001). Independent predictors included inotrope use within 24h (OR 9.6, p=0.005), NSAID exposure (OR 3.0, p=0.003), transfusion burden (FFP OR 1.15/unit, p=0.022; RBC OR 1.15/unit, p=0.029), elevated lactate (OR 1.77, p=0.012), and reduced diuresis (OR 0.15, p=0.002). Mannitol amplified AKI risk in elderly or highly catabolic patients (CK ≥5000 U/L). SOFA scores correlated with AKI (max SOFA ≥9: specificity 84%, AUC 0.71), while SOFA

amplitude showed excellent predictive value (AUC 0.87). Urinary sodium <40 mmol/L predicted AKI onset (PPV 63%, NPV 85%) and distinguished persistent from transient AKI (40.5 vs 88.7 mmol/L, p=0.011). NLR amplitude was an independent predictor (OR 1.04, p=0.044). Fractional excretion of potassium (FEK >30–40%) showed exploratory promise as a marker of tubular stress.

Conclusion. In this Albanian trauma ICU cohort, AKI was common and carried an extreme mortality burden, with Stage III universally fatal. High-risk patients include those receiving inotropes, NSAIDs, and transfusions. Urinary sodium and FEK show potential as early stratification markers. Importantly, sequencing of dynamic data of NaU trends, SOFA evolution, and inflammatory amplitudes, offers more significant predictive accuracy than static values, supporting continuous monitoring for improved AKI prediction.

OP-03 Risk factors and incidence of contrast-induced nephropathy in patients undergoing elective endovascular procedures. A retrospective cohort study

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Introduction. Contrast-induced nephropathy (CIN) has become a significant complication linked to the use of iodinated contrast media in diagnostic and therapeutic procedures. With the increasing global prevalence of chronic kidney disease (CKD), understanding the risks associated with contrast media exposure is essential. This study aimed to evaluate the incidence of CIN and identify its associated risk factors among patients undergoing endovascular interventions at a vascular surgery clinic in a tertiary hospital in Eastern Europe (Timisoara, Romania).

Methods. This retrospective cohort study analysed data from patients treated between January 1, 2018, and December 31, 2023. The study included adult patients who underwent scheduled endovascular procedures for peripheral arterial disease (percutaneous angioplasty with or without stent insertion or diagnostic peripheral arteriopathy) and had serum creatinine levels measured before and within 48h after the intervention. Patients were diagnosed with CIN if there was an increase in serum creatinine of at least 0,3 mg/dl within 48h after the administration of contrast media for the endovascular procedure, as per AKIN Group definition of AKI. The contrast media used was either iopromid or iodixanol within the 50-150 ml ranging in quantity, infused intra-arterial. We excluded patients with elevated inflammatory marker values, sepsis, hemodynamically unstable, missing key data, severe renal dysfunction (acute kidney injury at presentation or CKD stage 5 with eGFR<15 ml/min at presentation) or those who did not have complete follow-up.

Results. A total of 331 patients were included in the analysis, of whom 71.42% were male, with a mean age of 66.79±9.86 years. Among these, 9.22% had CKD, and 23.8% developed CIN. Multivariate logistic regression revealed that higher hemoglobin levels were associated with reduced odds of CIN (OR = 0.79, 95% CI: 0.659–0.952, p = 0.01), highlighting anemia as a significant risk factor. Additionally, CKD increased the odds of CIN by 85.8% (OR = 1.858, 95% CI: 1.105–3.125, p = 0.0023), confirming CKD as a critical predictor.

Conclusion. Anemia and CKD were identified as key predictors of CIN in patients undergoing elective endovascular procedures. Correcting anemia and ensuring stable baseline creatinine levels may be effective strategies for reducing CIN risk. Further research involving larger, more diverse populations is needed to validate these findings and explore additional risk factors.

OP-04 The role of serum potassium in uremic peripheral neuropathy: A comparative study between CKD stage 3-4 and stage 5

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Introduction. Uremic peripheral neuropathy (UPN) is a frequent and disabling complication of chronic kidney disease (CKD), particularly in its advanced stages. The condition arises through multiple mechanisms, including accumulation of uremic toxins, oxidative stress, and metabolic derangements. However, the contribution of electrolyte imbalances, especially disturbances in serum potassium, has received comparatively little attention. Hyperkalemia is common in CKD, and experimental data suggest that elevated extracellular potassium may depolarize axons and exacerbate neuropathic dysfunction. This study aimed to explore the relationship between serum potassium levels and neuropathy severity in patients with moderate-to-advanced CKD.

Methods. We performed a cross-sectional analysis of 63 non-diabetic adults with confirmed CKD, of whom 57% were in stages 3–4 and 33% in stage 5 (non-dialysis). Peripheral neuropathy was defined according to established literature as an MNSI score greater than

seven and/or abnormal findings on nerve **conduction** studies (NCS)**,** consistent with diagnostic thresholds used in prior epidemiological and clinical studies of CKD-related neuropathy. Neuropathy assessment was conducted within 24 hours of serum potassium measurement. Descriptive statistics, group comparisons, correlation testing, and multivariate regression analyses were applied.

Results. The mean age of participants was 65.1 years; 33% females. UPN was more prevalent and severe in stage 5 patients, with 63% recording an MNSI score >7 compared with 27% of those in stages 3–4 (p<0.001). Serum potassium levels were significantly higher in stage 5 patients compared with those in stages 3–4 (5.1 ± 0.6 vs. 4.75 ± 0.5 mmol/L, $p = 0.026$). A moderate positive correlation was found between serum potassium levels and MNSI scores ($r = 0.48$, $p < 0.03$). Multivariate regression analysis demonstrated that both potassium (β = +0.87, $p = 0.013$) and eGFR (β = –0.02, $p = 0.049$) were independent predictors of neuropathy severity, together accounting for 32% of the observed variance ($R^2 = 0.32$).

Conclusion. Elevated serum potassium is independently associated with increased severity of UPN in CKD, especially in stage 5 disease. The observed relationship supports experimental evidence connecting hyperkalemia to axonal depolarization and indicates that potassium imbalance may accelerate neuropathic changes even in earlier CKD stages. These findings highlight the importance of vigilant potassium monitoring and early correction of abnormalities as potentially modifiable strategies to slow neuropathy progression and enhance patient quality of life.

OP-05 Hyperuricemia in chronic kidney disease: A hidden catalyst of heart failure and valvular disease

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Introduction. Uric acid has long been considered a secondary by-product of impaired renal clearance, but growing evidence suggests it plays an active role in the cardio–renal continuum. Through mechanisms including endothelial dysfunction, oxidative stress, systemic inflammation, and stimulation of the renin–angiotensin system, hyperuricemia has been implicated in vascular remodeling, left ventricular hypertrophy, and valvular calcification. However, its prognostic significance in patients with chronic kidney disease (CKD) remains controversial. The present study aimed to determine the prevalence of hyperuricemia in a CKD cohort and to evaluate its associations with cardiac structural abnormalities and biomarkers of cardiovascular stress.

Methods. We performed a cross-sectional study in 100 patients with CKD stages II–V, including 21 on hemodialysis. Clinical data, comorbidities, and biochemical parameters were collected. Hyperuricemia was defined as serum uric acid >7 mg/dL in men and >6 mg/dL in women. Echocardiographic evaluation included left ventricular ejection fraction (LVEF), left ventricular hypertrophy (LVH), diastolic function, and valvular calcifications. NT-proBNP was measured as a marker of myocardial stress. Associations between uric acid levels and cardiovascular features were analyzed using correlation tests and multivariate logistic regression.

Results. Hyperuricemia was present in 58% of patients and was more frequent in advanced CKD stages (72% in stages IV–V vs. 46% in stages II–III, p<0.05). Patients with hyperuricemia had significantly higher rates of LVH (60% vs. 35%, p=0.02) and valvular calcifications (51% vs. 28%, p=0.03). Uric acid levels correlated positively with NT-proBNP (r=0.30, p=0.01) and inversely with LVEF (r=-0.28, p=0.02). In logistic regression, hyperuricemia was confirmed as an independent predictor of LVH (OR 1.9, 95% CI 1.05–3.6, p=0.04), even after adjustment for age, diabetes, and hypertension.

Conclusion. Hyperuricemia is common in CKD and is independently linked to adverse cardiac remodeling and calcific valvular disease. Far from being a passive marker of reduced renal function, uric acid emerges as an active metabolic and inflammatory risk factor. Its routine evaluation may improve cardiovascular risk stratification in CKD, and future interventional trials are needed to clarify whether urate-lowering therapy can modify outcomes.

OP-06 Integrated Screening of MASLD and CKD in Type 2 Diabetes: A Prospective Cohort Study

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Introduction. Chronic kidney disease (CKD) is routinely screened in diabetes [1], while metabolic

dysfunction–associated steatotic liver disease (MASLD) has only recently been recognized as a frequent comorbidity. The latest American Diabetes Association (ADA) Consensus Report highlighted its high prevalence and recommends systematic screening and early intervention in type 2 diabetes mellitus (T2DM) patients [2]. Given their shared mechanisms—insulin resistance, inflammation, and metabolic dysregulation—combined assessment of CKD and MASLD may improve risk stratification. This study prospectively examined their relationship in T2DM, focusing on metabolic and therapeutic profiles.
Methods. We enrolled 91 patients with T2DM and MASLD (from 105 screened) from County Emergency Hospital "Pius Brinzeu", Timișoara (Jan–Dec 2023). CKD was staged by KDIGO 2024 criteria (eGFR, UACR), while MASLD was assessed using FibroScan® (CAP, LSM). Laboratory work-up included renal, hepatic, and metabolic biomarkers. Clinical characteristics and antidiabetic therapy were recorded.
Results. CKD was identified in 60.4% of patients, most frequently in stages G2–G3. More than half of the cohort was obese (BMI >30 kg/m² in 56%), while 70.3% had hypertension. Patients with CKD exhibited poorer metabolic control (fasting glucose 201.2 ± 55.4 vs. 173.5 ± 56.7 mg/dL, p=0.002), higher CRP (15.9 ± 8.7 vs. 6.9 ± 6.1 mg/L, p=0.03), and as expected markedly elevated UACR (1525.6 ± 347.1 vs. 17.3 ± 6.3 mg/dL, p=0.02). When analyzed by therapy, insulin-treated patients had a longer diabetes duration (18.3 ± 15.1 vs. 13.7 ± 4.9 years, p=0.043), higher BMI (36.1 ± 7.7 vs. 30.3 ± 5.2 kg/m², p=0.0005), poorer glycemic control (HbA1c 9.8 ± 1.05% vs. 8.4 ± 1.6%, p=0.002), higher CRP (15.9 ± 8.7 vs. 6.9 ± 6.06 mg/L, p=0.03), and more advanced CKD (eGFR 57.1 ± 30.3 vs. 74.2 ± 19.9 ml/min/1.73m², p=0.002). In contrast, patients on oral agents exhibited a lower degree of hepatic fibrosis (LSM 8.4 ± 6.4 vs. 12.8 ± 6.4 kPa, p=0.004). No significant differences were observed in steatosis between CKD and non-CKD groups (CAP 321.6 ± 50.9 vs. 321.2 ± 46.2 dB/m, p=0.97). A positive correlation between eGFR and CAP (r=0.751, p=0.03) suggested a link between renal hyperfiltration and hepatic fat accumulation.
Conclusions. This cohort illustrates the dual burden of CKD and MASLD in T2DM and the role of obesity, poor glycemic control, systemic inflammation, and insulin therapy in accelerating organ damage. In line with the ADA 2025 Consensus Report, integrated screening for MASLD and CKD should become routine in diabetes care.

OP-07 Venous thromboembolism as a chronic kidney disease complication or early symptom

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Introduction. Patients with chronic kidney diseases have significantly increased risk of venous thromboembolism (VTE). It includes deep VTE, usually in the lower limbs and pulmonary embolism (PE)**.** All severities of kidney disease appear to increase the risk of venous thromboembolism. In the general population the risk associated with mild to moderate kidney disease is increased 1.3 to 2 time the average rate. Risk increases after kidney transplant and with nephrotic syndrome as well. The connection depends on what causes chronic kidney disease and the stage of the kidney damage. The risk for venous thrombosis is more often seen in people with nephrotic syndrome and systemic diseases compared to patients without nephrotic syndrome. Those with nephrotic syndrome have a 39% increase in risk of DVT and a 72% increased risk of PE. Dyslipidemia and underlying atherosclerosis lead to further endothelial dysfunction. Chronic renal diseases can lead to prothrombotic state via different mechanisms, including antiphospholipid antibodies, changes in vascular wall and/or platelets, urinary loss of anticoagulant factors in nephrotic syndrome and paraneoplastic thromboses. The combination of increased creatinine and urea levels or urinary abnormalities must focus the search for underlying chronic nephropathy. The aim of our study is to evaluate the causes of DVT in patients in whom the thrombosis leads to the diagnosis of underlying chronic nephropathy.
Methods. 21 patients (15 males and 6 females, aged 31-78 years), admitted in the Clinic of Nephrology, University Hospital St. Iv. Rilski in whom deep venous thrombosis was the initial symptom that led the discovery of the underlying renal disease.
Results. 7 patients presented with PE, 14 patients presented with peripheral venous thrombosis. Out of the 21-patients group, 5 had systematic lupus (SLE), 5 had chronic glomerulonephritis, 2 had amyloidosis, 3 had cancer, 6 had advanced chronic kidney disease. 7 patients presented with nephrotic syndrome. The patients that had pulmonary embolism were diagnosed via SPECT/Computer tomography of lungs. Peripheral thrombosis was proven via Doppler sonography. Five patients were tested for thrombophilia.
Conclusion. VTE has a high incidence in patients with CKD. In some cases VTE can be described as an early symptom for CKD, while in its last stage the number of complications of VTE are increased. Anticoagulation therapy is recommended for an early start. Sustained anticoagulation therapy in patients with CKD limits VTE complications. Rates of kidney disease are increasing rapidly in the population and kidney disease is a risk factor for VTE.

OP-08 Hyperkalemia in chronic kidney disease: risk factors, outcomes, and the impact of acute kidney injury

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Introduction. Hyperkalemia is a frequent and potentially life-threatening electrolyte disorder in CKD patients, often aggravated by AKI and the use of renin–angiotensin–aldosterone system (RAAS) inhibitors. We aimed to assess the prevalence, risk factors, and outcomes of hyperkalemia in patients admitted to a tertiary nephrology clinic.

Methods. We performed a retrospective cross-sectional study of 117 CKD patients admitted with hyperkalemia (serum K^+ >5 mmol/L) to the Nephrology Department of the County Emergency Hospital "Pius Brânzeu" Timișoara in 2018. Demographic, clinical, and laboratory data (comorbidities, CKD and AKI stage, serum creatinine, urea, albumin, CRP, medication, dialysis requirement, length of stay, readmissions, and mortality) were collected from medical records. CKD and AKI were defined and staged according to KDIGO guidelines. Statistical processing was performed using GraphPad Prism v.8.

Results. A total of 117 CKD patients were included (mean age 64.8 ± 14 years; 51.3% male). Heart failure was present in 78.6% and diabetes mellitus in 42.7%, while urinary tract infections and sepsis were documented in 23% and 20.5% of cases, respectively. CKD was predominantly advanced: stage 1–2, 8.8%; stage 3, 22.1%; stage 4, 23.8%; stage 5, 33.6%; and stage 5D, 11.1%. Superimposed AKI occurred in 47.8% of patients, most frequently stage 3 (69.6%), with prerenal etiology predominating (83.9%). Prior to admission, 26.4% of patients were treated with ACEI/ARBs, 11.9% with spironolactone, and 7.7% with both. Hyperkalemia correlated positively with age (p=0.008), AKI (p=0.002), prerenal AKI (p<0.0001), and spironolactone use (p<0.0001). Compared with AKI-negative patients, those with AKI were older (70.7 vs. 59.3 years, p<0.0001), had higher CRP (47 vs. 22 mg/L, p=0.02) and admission potassium (6.3 vs. 5.8 mmol/L, p=0.002), longer hospitalization (10.7 vs. 7.5 days, p=0.03), and higher in-hospital mortality (5.1% vs. 0.8%, p=0.03). Spironolactone (10.2% vs. 1.7%, p=0.002) and combined ACEI/ARB + spironolactone therapy (6.8% vs. 0.8%, p=0.01) were more frequent in the AKI group. Interestingly, hemodialysis was required more often in AKI-negative patients (20.5% vs. 8.5%, p=0.01), and readmissions for hyperkalemia were also more frequent (21.3% vs. 5.9%, p=0.0006). Overall, in-hospital mortality was 6%, readmission rate was 27.3%, and hemodialysis was required in 28.8% of cases.

Conclusion. Hyperkalemia in CKD is associated with advanced disease, RAAS inhibitor use, and superimposed prerenal AKI. It carries substantial risks of recurrence, dialysis, and mortality, underscoring the need for careful monitoring and individualized management.

OP-09 Liquid-Phase Separation and Mass Spectrometry for Ganglioside Analysis in Renal Pathology

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Introduction. Gangliosides, sialylated glycosphingolipids with amphiphilic properties, are critical regulators of cellular recognition, signaling, and apoptosis. While predominantly studied in the nervous system, increasing evidence highlights their importance in kidney physiology and pathology. Altered ganglioside expression has been implicated in podocyte injury, diabetic nephropathy, and renal involvement in systemic metabolic and inflammatory diseases. Despite their low abundance in biological fluids such as plasma, urine, and cerebrospinal fluid, changes in ganglioside composition may serve as sensitive biomarkers of renal dysfunction. The aim of this review is to summarize advances in liquid-phase separation techniques coupled to high-resolution mass spectrometry (MS) for the analysis of gangliosides in body fluids, with a particular focus on their renal relevance.

Methods. Recent literature on liquid chromatography (LC), hydrophilic interaction chromatography (HILIC), ultrahigh-performance LC (UHPLC), ion

mobility separation (IMS), and electrophoretic methods coupled to MS/MS was reviewed. Emphasis was placed on methodological improvements enabling detection of low-abundance gangliosides, structural elucidation of ceramide and glycan portions, and application to renal-related conditions.

Results. MS-based gangliosidomics has enabled detailed mapping of gangliosides in serum, plasma, urine, and kidney tissue extracts. In diabetic nephropathy, altered GM3 and GD3 profiles correlate with glomerular injury, insulin resistance, and podocyte apoptosis. Studies have shown that loss of specific gangliosides from podocyte membranes exacerbates proteinuria and accelerates progression of chronic kidney disease. In systemic metabolic diseases such as type 2 diabetes mellitus, circulating ganglioside patterns reflect renal involvement and disease severity. Furthermore, changes in ganglioside species detected in serum and urine have been associated with immune-mediated renal injury, suggesting their role as biomarkers in lupus nephritis and transplant rejection. Advances in UHPLC–MS/MS and IMS–MS techniques now allow quantitative and structural analysis from minimal sample volumes, offering noninvasive opportunities to monitor renal pathology.

Conclusion. Liquid-phase separation techniques coupled with high-resolution MS provide unprecedented sensitivity and specificity for ganglioside analysis in biological fluids. These advances offer new perspectives for nephrology, where altered ganglioside metabolism contributes to diabetic nephropathy, chronic kidney disease, and immune-mediated renal disorders. Ganglioside profiling in serum and urine has the potential to become a powerful noninvasive biomarker platform for early detection, risk stratification, and therapeutic monitoring in renal diseases. Future efforts should focus on standardizing analytical protocols, integrating gangliosidomic data with clinical nephrology, and validating findings in large patient cohorts to establish clinical applicability.

OP-10 Current perspectives on gut-derived biomarkers in early diabetic kidney disease and their interconnection to the renal–cerebral axis. Implications for clinical practice and future research

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Introduction. Type 2 diabetes mellitus (T2DM) impairs patients' quality of life and imposes an economic burden, primarily via renal and neurological complications. Gut dysbiosis, driven by obesity and insulin resistance, plays an important role in the development of T2DM complications. The blood–brain barrier and glomerular basement membrane share structural features that render them highly vulnerable to hyperglycemia induced stress and inflammation, these changes often preceding the clinical diagnosis of diabetic kidney disease (DKD) and cerebrovascular microangiopathy (CMA). As a result, these complications are usually detected at advanced stages. The growing incidence of DKD underscores the limitations of our traditional biomarkers and drives research towards early indicators of renal and cerebrovascular damage.

Methods. Blood and urine samples of DKD patients, in different stages of albuminuria, were analyzed using ultra-high performance liquid chromatography coupled with electrospray-ionization quadroupole time-of-flight mass spectrometry (UHPLC-QTOF-ESI$^+$-MS) in order to acquire the gut-derived metabolites in an untargeted and targeted manner. The markers of podocyte [podocalyxin (PDX)], proximal tubule [kidney injury molecule 1 (KIM-1)] and endothelial damage [(intercellular adhesion molecule 1 (ICAM-1)], were assesed by ELISA technique and the cerebrovascular indices [intima-media thickness (IMT), breath-holding index (BHI)] were determined by neurosonography. The association between the detected gut-derived metabolites, specific to the normoalbuminuric subgroup, and markers of renal and cerebral damage was studied by univariable and multivariable linear regression analyses.

Results. The study provided a subset of metabolites, specific for the normoalbuminuric DKD, that may

determine renal and cerebral damage. Low levels of serum arginine were inversely associated with IMT and ICAM-1. Serum levels of butenoylcarnitine positively correlated with IMT and ICAM-1, whereas urine butenoylcarnitine correlated with KIM-1 and PDX. Serum sorbitol was negatively correlated with BHI. Serum indoxyl sulfate correlated with ICAM-1 and p-cresyl sulfate was associated with KIM-1, being considered biomarkers of endothelial dysfunction and proximal tubular dysfunction.

Conclusion. Our research revealed a subset of gut-derived metabolites with a potential role in early diagnosis and therapeutical target development in order to prevent DKD and CMA onset. Arginine levels may predict common carotid atherosclerosis and renal endothelial dysfunction thus arginine supplementation may reduce the incidence of stroke, renal hyperfiltration and proteinuria. Butenoylcrnitine may represent a future therapeutical target for drug develpoment related to podocyte and proximal tubule dysfunction in DKD, whereas sorbitol may represent a new therapeutical target for CMA prevention. Prebiotics, probiotics and symbiotics administration may have positive effects on delaying DKD development.

OP-11 Quantitative and Targeted Analysis of Serum and Urinary Metabolites Uncovers Novel Biomarkers for Early Chronic Kidney Disease

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Introduction. Traditional diagnostic methods of chronic kidney disease, based on albuminuria and estimated glomerular filtration rate, are limited in their ability to detect early disease stages or predict progression. The aim of the present study was to perform targeted metabolomic analysis of serum and urine from patients with chronic kidney disease in order to validate candidate metabolites previously identified through untargeted approaches and to assess their diagnostic and prognostic potential.

Methods. A total of one hundred individuals were included, consisting of eighty patients with chronic kidney disease at various stages, without diabetes, and twenty age- and sex-matched healthy controls. Serum and urine samples were collected, processed by protein precipitation, and analysed using ultra-high-performance liquid chromatography coupled with electrospray ionization quadrupole time-of-flight mass spectrometry. The targeted metabolomic panel included amino acids, acylcarnitines, creatinine, arginine, asymmetric dimethylarginine, and kynurenic acid. Data analysis comprised multivariate and univariate statistics, principal component analysis, partial least square discriminant analysis, and receiver operating characteristic curve evaluation. Quantitative performance was ensured by calibration with pure standards, validation of linearity, precision, accuracy, and determination of detection and quantification limits.

Results. The targeted profiling identified significant differences between patients with early-stage chronic kidney disease and healthy controls. In serum, asymmetric dimethylarginine, methionine, and kynurenic acid showed marked increases, while acetylcarnitine and propenoylcarnitine displayed significant variations. In urine, phenylalanine, arginine, and methionine were consistently modified in early disease compared to controls. These results indicate that metabolic disturbances can be detected before overt renal dysfunction becomes clinically evident, suggesting that the identified metabolites may serve as early diagnostic biomarkers.

Conclusion: This study demonstrates that targeted metabolomic analysis can identify and validate a panel of serum and urinary metabolites with diagnostic and prognostic relevance in chronic kidney disease. The integration of alterations in arginine metabolism, acylcarnitine pathways, and the kynurenine axis highlights their involvement in the pathophysiology of early renal injury. These findings provide a strong rationale for the development of biomarker-based strategies aimed at earlier detection, improved risk stratification, and potential therapeutic monitoring in chronic kidney disease.

OP-12 Early arteriovenous fistula outcomes under the shadow of anemia and inflammation

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Introduction. Arteriovenous fistula (AVF) remains the preferred vascular access for hemodialysis due to superior long-term patency compared with grafts or catheters [1]. However, early AVF failure is common and limits its clinical utility [2]. Previous studies have highlighted the role of anemia, inflammation, and vascular characteristics in determining AVF maturation [3–5]. This pilot analysis reports the first three-month results of an ongoing three-year prospective study in our center.

Methods. We prospectively studied 24 patients (16 men, 8 women; mean age 55 years) who underwent AVF creation at our center and were followed for three months. AVFs were classified as functional or failed at 90 days. Functional AVFs were usually cannulated in weeks 6–8, while most failures occurred around week 2. Hemoglobin (Hb), ferritin, and C-reactive protein (CRP) levels were analyzed as predictors of AVF outcome. Kaplan–Meier curves, log-rank tests, and Cox regression were applied.
Results. At three months, 14 AVFs were functional and 10 had failed. Failures occurred between days 3 and 60, mostly in the second week. Kaplan–Meier analysis showed significantly poorer survival in patients with Hb <8 g/dL and 8–10 g/dL compared with Hb >10 g/dL (log-rank p<0.001). Patients with high CRP (>5 mg/L) had a 75% failure rate versus 29% in those with low CRP. In Cox regression, CRP was an independent predictor of failure, while higher Hb was protective. Fistula site showed a non-significant trend toward better outcomes for brachiocephalic access.
Conclusion. This pilot study demonstrates that severe anemia and elevated CRP are major determinants of early AVF failure. These findings are consistent with previous reports [3–5] and suggest that preoperative correction of anemia and control of inflammation may improve AVF maturation and survival. Although limited by sample size, the study underlines the importance of systematic monitoring and provides a basis for the ongoing three-year prospective analysis, which aims to generate stronger evidence for risk-stratified vascular access management.

OP-13 CRRT and PIRRT in dialysis-dependent patients

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Introduction. Dialysis-dependent patients often require continuous renal replacement therapy (CRRT) or prolonged intermittent renal replacement therapy (PIRRT) during hospitalization. The aim of this study was to evaluate the impact of CRRT/PIRRT parameters on 90-day mortality in dialysis-dependent patients.
Methods. The retrospective, observational study included 139 CRRT/PIRRT procedures performed on 53 dialysis-dependent patients. PIRRT procedures were done using CRRT machines. Procedures were performed with (heparin or regional citrate anticoagulation), or without anticoagulation. Vascular access was achieved using arteriovenous fistulas, temporary or permanent central venous catheters (CVCs). Procedure-related data, information on comorbidities and current medical status, and baseline laboratory findings, were collected. Variables were compared with respect to 90-day mortality using appropriate statistical tests. The influence of various factors on mortality, including variable models, was assessed using logistic regression.
Results. Data related RRT procedures, clinical status and comorbidities are presented in Table 1. Patients were divided into two groups based on 90-day mortality. Better survivor was observed in patients with a higher prescribed RRT dose (p=0.001) and in those with temporary CVCs (p<0.001). A borderline significance was found for procedures done without anticoagulation compared to those with its use (p=0.056). Male patients had better survival (p<0.001). Clinical conditions that influenced survival included residual diuresis (p=0.016), the need for vasoactive support (p=0.005), and mechanical ventilation (p<0.001). Higher mortality was associated with non-surgical causes of hospitalisation (p<0.001) and diabetes (p<0.001). Survivors had lower CRP (p=0.009), aPTT (p=0.049) and PT (p<0.001), but higher creatinine (p<0.001), urea (p<0.001), and albumin levels (p=0.023). Logistic regression analysis identified significant predictors of 90-day mortality: total RRT dose (p<0.001), RRT dose/body weight (BW) (p=0.030), vascular access (p<0.001), gender (p<0.001), previous surgery (p<0.001), diabetes (p<0.001), residual diuresis (p<0.001), and the need for vasoactive support (p=0.003) or mechanical ventilation (p<0.001). The influence of filter choice (p=0.080) and anticoagulation (p=0.066) was not significant. A predictive model for 90-day survivor was built using procedure-related variables with p values less than 0.1 in logistic regression. The model demonstrated strong predicting performance, with an accuracy of 0.863 and an AUC of 0.890. Sensitivity was high (0.924), while specificity was moderate (0.676) (Graph 1).

Table 1 – Data regarding RRT, clinical status, and comorbidities

variable	**median**	**IQR**
length of RRT	530 min	480 min
total UF	2454 ml	1900 ml
UF/h	225 ml/hr	164.58 ml/hr
prescribed RRT dose	2500 ml/hr	900 ml/hr
prescribed RRT dose/BW	31.11 ml/kg/hr	3.33 ml/kg/hr
age	69 years	9 years
survivor after RRT	10 days	16 days
variable		**N (%)**
90-day mortality	**died**	105 (75.54%)
	alive	34 (24.46%)
RRT modalities	**CVVHD**	48 (34.53%)

	CVVHDF	91 (65.47%)
filters	**Emic2**	48 (34.53%)
	Kit8/1000	28 (20.14%)
	Oxiris	18 (12.95%)
	ST150	45 (32.37%)
anticoagulation	**heparin**	73 (52.52%)
	RCA	27 (19.42%)
	without	39 (28.06%)
vascular access	**AVF**	46 (33.09%)
	temporary CVC	73 (52.52%)
	permanent CVC	20 (14.39%)
surgery prior to RRT	**yes**	57 (41.01%)
	no	82 (58.99%)
need for vasoactive support	**yes**	48 (34.53%)
	no	91 (65.47%)
need for mechanical ventilation	**yes**	86 (61.87%)
	no	53 (38.13%)
diabetes	**yes**	76 (54.68%)
	no	63 (45.32%)

Legend: RRT – Renal replacement therapy; UF – ultrafiltration; BW – body weight; RCA – regional citrate anticoagulation; AVF – arteriovenous fistula; CVC – central venous catheter

Conclusion. Among RRT-related parameters, only the total prescribed RRT dose, RRT dose/BW, and vascular access significantly influenced 90-day mortality in hospitalised dialysis-dependent patients. Filter and anticoagulation choice had only a moderate impact. The model including these variables demonstrated excellent discrimination in predicting 90-day mortality.

OP-14 Cognitive impairment across renal replacement therapies in chronic kidney disease: prevalence and predictors in a cross-sectional study

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Introduction. Cognitive impairment is increasingly recognised in people with chronic kidney disease, yet comparative data across the main renal replacement therapies remain limited. We sought to estimate its prevalence across haemodialysis, peritoneal dialysis and kidney transplantation and to identify domain-specific predictors using a validated bedside screening tool.

Methods. In a cross-sectional study conducted at the University Hospital "Mother Teresa" (Tirana) from November 2023 to November 2024, 319 adults completed the Montreal Cognitive Assessment. We analysed 193 participants with chronic kidney disease [haemodialysis = 96; peritoneal dialysis = 22; kidney transplantation = 75] and 126 non-kidney controls. Independent t-tests and analysis of variance compared mean scores. Multivariable logistic regression (n = 193 complete cases) modelled cognitive impairment (mild to severe). Discrimination was quantified with the area under the receiver operating characteristic curve.

Results. Participants with chronic kidney disease scored lower than controls (23.1 ± 3.1 versus 24.4 ± 2.6; $p < 0.001$). Severe or moderate impairment occurred in 9% of patients versus 2% of controls. In adjusted models, lower executive/visuospatial ($\beta = -2.00$; $p < 0.001$), attention ($\beta = -1.96$; $p < 0.001$) and memory scores ($\beta = -1.73$; $p = 0.003$) independently predicted impairment. Treatment modality carried differential risk: peritoneal dialysis (odds ratio = 0.30; $p = 0.018$) and kidney transplantation (odds ratio = 0.14; $p = 0.043$) were protective, whereas haemodialysis was not. Age, systolic and diastolic blood pressure, and blood glucose were not significant. The model showed strong discrimination (area under the curve 0.842; 95% confidence interval 0.773–0.911) with 95% sensitivity and 72% specificity at the Youden index of 0.573.

Conclusions. Cognitive impairment is common in chronic kidney disease and predominantly involves executive, attentional and memory domains. Peritoneal dialysis and kidney transplantation appear to confer relative neuroprotection compared with haemodialysis. A simple multivariable screen derived from Montreal Cognitive Assessment domains achieved high sensitivity and can help nephrology services triage candidates for comprehensive neuropsychological testing and incorporate cognitive health into shared decisions about renal replacement therapy.

OP-15 Dietary Antioxidants and Their Relationship with Oxidative Stress in Hemodialysis Patients

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Introduction. We know that chronic kidney disease (CKD) is linked to oxidative stress due to ongoing inflammation and a reduced intake or availability of dietary antioxidants. The relationship between lifestyle, oxidative stress, and CKD in patients on hemodialysis is complex and interconnected. In this study, we analysed the relationship between an oxidative damage marker (malondialdehyde-MDA) on one hand and plasma antioxidant status (glutathione peroxidase-GPx) on the other, as well as the complications associated with chronic kidney disease (anemia, CKD-MBD).

Methods. We conducted a single-center cross-sectional study that included 58 CKD G5D patients (mean age 60.39 +/- 11.73 years; 33 male, 25 female; mean hemodialysis vintage of 6.43 +/- 4.89 years). All patients were evaluated for their dialysis status based on medical history. Blood samples were collected prior to the dialysis session for analysis, including standard biochemical parameters, complete blood count, and measurements of GSSG and MDA using high-performance liquid chromatography. In all patients the monthly intake of antioxidant nutrients has been performed using a semi-quantitative food frequency questionnaire.

Results. Malondialdehyde showed no significant correlation with: Gender (r = -0.008, *p = 0.95*); Trans-β-carotene intake (r = -0.081, *p = 0.547*); Vitamin E-alpha intake (r = -0.127, *p = 0.3419*); Vitamin E-beta intake (r = -0.143, *p = 0.2828*); Vitamin E-gamma intake (r = -0.035, *p = 0.7971*); Vitamin E-delta intake (r = -0.113, *p = 0.3985*). A significant negative correlation was found between malondialdehyde and vitamin C intake (r = -0.321, *p = 0.014*).; MDA was also negatively correlated with echocardiographic atheroma grade A0 (r = -0.234, *p = 0.1641*), though not significantly. There was a negative correlation between glutathione peroxidase levels and sleep duration (r = -0.354, *p = 0.063*), approaching statistical significance. Between Vitamin E Isoforms intake and sleep duration no significant correlations were found: Vitamin E-alpha (r = -0.083, *p = 0.5336*); Vitamin E-beta (r = -0.075, *p = 0.5742*); Vitamin E-gamma (r = -0.085, *p = 0.5268*). In patients with hyperkalemia, no significant correlations were observed between: Vitamin E-delta (r = -0.087, *p = 0.5176*); Vitamin E-gamma (r = -0.114, *p = 0.3933*). Blood selenium levels showed no statistically significant correlation with: Glutathione peroxidase (r = -0.17, *p = 0.201*); Hemoglobin (r = -0.015, *p = 0.9082*); BMI (r = -0.074, *p = 0.5784*). No significant correlations were found between selenium and any of the measured amounts of antioxidant intakes.

Conclusion. Overall, while certain antioxidants like vitamin C may play a role in modulating oxidative stress, further studies with larger sample sizes and controlled designs are necessary to clarify these relationships and their clinical relevance in hemodialysis populations.

OP-16 Our experience of vascular access for hemodialysis. Evolution, challenges and future perspectives

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Introduction. Over the past 50 years, vascular access (VA) has played a critical role in the success of hemodialysis (HD). Since the introduction of the arterio-venous fistula (AVF), significant improvements were made in access techniques, materials, and management strategies. Despite these developments, VA complications remain a major challenge, impacting patient outcomes and healthcare resources. This study provides an overview of our 50 year experience in VA for HD, highlighting key advancement, clinical challenges, and future directions.

Methods. A retrospective analysis of experience, patient outcomes, and technological advancements in VA was conducted. Literature reviews and registry data were also examined to contextualize our findings within broader clinical trends.

Results. Our 50 year experience reflects significant progress in surgical techniques, access surveillance, and complication management. The shift from central venous catheters (CVC) to AVF and arterio-venous grafts (AVG) has improved long term outcomes, while innovations such as endovascular procedures and bioengineered grafts offer promising alternatives. In the beginning we started with AV shunts, then continue with CVC (femoral, subclavian, and jugular), and AVF, AVG and tunneled catheters as permanent VA. However, access failure due to stenosis, thrombosis, and infection remains a persistent challenge. Advances in imaging, vascular biology, and precision medicine are paving the way for improved access longevity and functionality.

Conclusion. Reflecting on 5 decades of VA experience, we recognize both, the achievements and ongoing challenges in HD access. Future efforts should focus on optimizing patient selection, enhancing surveillance strategies, and integrating novel technologies to improve VA outcomes.

OP-17 Impact of SGLT2i on mortality and outcomes in advanced kidney disease and dialysis utilising a global real-world clinical data platform, TriNetX

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Introduction. Chronic kidney disease (CKD) is the third fastest-growing cause of death worldwide, with an increasing burden of end-stage renal disease (ESKD). SGLT2-inhibitor (SGLT2i) trials demonstrate overwhelming benefit in heart failure, diabetes and CKD. Patients with advanced-CKD (adCKD) and dialysis, however, have been systematically excluded from major SGLT2i trials, restricting use. Preclinical studies suggest off-target effects which may benefit these populations. This study aims to leverage real-world data to address gaps in evidence regarding the effects of SGLT2i on renal outcomes and mortality in adCKD and dialysis patients.

Methods. TriNetX, a global health collaborative clinical research platform collecting real-time

electronic data, was used to identify anonymised cohorts of adults with adCKD (eGFR<25ml/min), and those on dialysis, treated with or without SGLT2i. In the adCKD cohort, the primary outcome was a composite measure of progression to ESKD and all-cause mortality. In the dialysis cohort, the outcome measures include all-cause mortality and hospitalisations. In addition, sub-cohort analyses were undertaken in two groups: i) stable adCKD (eGFR<25ml/min, excluding a fall in eGFR<20ml/min within 1 year) and ii) eGFR<10ml/min. Cohorts were adjusted for baseline co-morbidities with propensity score matching, survival analysis and log-rank test performed. Hazard ratios (HR; 95% CI) and Kaplan-Meier survival analysis was used to compare outcomes.

Results. Among 3,795,402 patients identified with adCKD, propensity matching yielded a cohort of 15,276. In this matched cohort, SGLT2i use was associated with significantly reduced composite renal outcome (HR 0.542; 0.521-0.563), progression to CKD5 (HR 0.844; 0.814-0.876), mortality (HR 0.325; 0.305-0.346) and hospitalisations (HR 0.526; 0.507-0.546). In a subgroup analysis, the stable adCKD cohort showed sustained benefit, with reduced composite renal outcome (HR 0.722; 0.675-0.772), mortality (HR 0.598; 0.541-0.661) and hospitalisations (HR 0.729; 0.687-0.773). Furthermore, in a matched cohort of 4,557 patients with eGFR<10, reduced mortality (HR 0.281; 0.252-0.314) and hospitalisations (HR 0.613; 0.573-0.656) was demonstrated. Among 97,253 patients undergoing dialysis, propensity matching identified 701 patients for comparative analysis. The benefit of SGLT2i persisted in dialysis, with reduced mortality (HR 0.765; 0.626-0.936) and reduced hospitalisations (HR 0.784; 0.694-0.885).

Conclusions. In this global cohort, SGLT2i use was associated with improved renal outcomes and all-cause mortality in both patients with adCKD and on dialysis, despite current regulatory exclusion. Our study can inform future randomised trials investigating SGLT2i use in adCKD to reduce progression and improve survival in dialysis-dependent patients. These findings support evidence of the benefit of SGLT2i in improving mortality and burden of adCKD and dialysis.

OP-18 Arteriovenous fistula calcifications – innocent bystanders?

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Introduction. Arteriovenous fistulas (AVFs) are considered the gold standard for vascular access (VA) in patients undergoing maintenance hemodialysis (HD). Although HD patients are at increased risk for extraosseous calcifications, AVF calcifications remain a relatively underexplored VA-related complication. This study aimed to determine the prevalence and risk factors of AVF calcifications and to evaluate their 5-year impact on AVF function and overall mortality.

Methods. We conducted a 5-year prospective study involving 161 patients receiving maintenance HD. Baseline data included VA history, comorbidities, demographic information, subjective global assessment (SGA) scores, and biochemical parameters. All participants underwent comprehensive AVF ultrasonography to assess AVF blood flow and identify calcifications, stenoses, and aneurysms.

Results. AVF calcifications were present in 39% of patients. Univariate analysis showed that AVF calcifications were associated with other VA complications (stenoses and aneurysms), longer AVF and HD duration, and elevated serum calcium and parathyroid hormone (PTH) levels. Multivariate analysis identified longer HD vintage and higher calcium levels as independent predictors of AVF calcifications. However, the presence of AVF calcifications did not significantly influence 5-year fistula patency or overall mortality.

Conclusion. AVF calcifications were a common finding in this cohort, but their presence did not adversely affect 5-year AVF patency or survival outcomes.

OP-19 Can the VEINES-QoL/Sym Questionnaire be adapted to the arm for use in hemodialysis patients with arteriovenous fistulas? Impact of AVF care education on quality of life and symptom burden

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Introduction. Similar to the venous congestion in chronic venous disease of the lower extremities, arteriovenous fistula (AVF) in hemodialysis (HD) patients inherently increases venous pressure in the upper extremity, leading to congestion and reduced quality of life (QoL). However, there is currently no objective tool to assess or quantify this QoL impairment. No validated questionnaire exists to evaluate symptoms related to upper extremity venous

congestion and hypertension, nor to measure the impact of patient education on these outcomes. This study aimed to adapt the VEINES-QOL/Sym questionnaire—originally developed for lower extremities—into an upper extremity-specific version for HD patients with AVF, assess its validity and reliability, and evaluate whether structured AVF care education improves symptoms and QoL.

Methods. A prospective study was conducted between 01.07.2025 and 31.07.2025 in five HD centers, including 100 patients (50% female, mean age 57.33±14.75 years). Participants were assigned to an education group (n=80) receiving structured AVF care training with both verbal and written materials by a nephrovascular team (nephrologist, cardiovascular surgeon, dialysis nurse) or a control group (n=20). The VEINES-QOL/Sym was modified for the upper limb and administered pre- and post-intervention alongside the SF-36. Content validity was evaluated using CVR and CVI; internal consistency by Cronbach's alpha; and construct validity by confirmatory factor analysis (CFA).

Results. The adapted questionnaire showed excellent content validity (CVR=0.99, CVI=1.00) and good internal consistency (Cronbach's alpha: VEINES-Sym=0.894, VEINES-QOL=0.695). CFA demonstrated good model fit (RMSEA=0.043, CFI=0.954, GFI=0.977). Baseline VEINES-Sym scores were higher in the education group (31.13±7.19) vs. control (26.55±6.97, p=0.009). Post-intervention, the education group had greater improvements in VEINES-Sym (+5.03±7.83 vs. +3.55±7.8, p=0.037), VEINES-QOL (+6.78±8.73 vs. +3.20±7.82, p=0.019), and total VEINES scores (+11.8±13.69 vs. +6.75±12.77, p=0.036). In SF-36, the education group showed significant improvement in mental component scores (p=0.006).

Conclusion. The first upper extremity adaptation of the VEINES-QOL/Sym questionnaire is a valid and reliable tool for assessing AVF-related symptoms and QoL in HD patients. Structured AVF care education, delivered verbally and in writing by a multidisciplinary nephrovascular team, significantly reduces symptoms and improves QoL. This approach fills the gap of lacking objective tools for upper extremity venous congestion and demonstrates that targeted patient education can lead to measurable clinical and patient-reported benefits.

<u>OP-20</u> Inflammatory Cytokines and Cardiac Remodeling in Hemodialysis: IL-6 Outperforms TNF-α

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Introduction. Cardiovascular disease is the main cause of death in end-stage renal disease (ESRD), with chronic inflammation contributing to myocardial remodeling. IL-6 and TNF-α are central cytokines, but their relative clinical significance in hemodialysis (HD) remains uncertain.

Methods. We studied 58 maintenance HD patients (mean age 60.4 ± 11.7 years, 55% male). Pre-dialysis serum IL-6, TNF-α, IL-1β, C-reactive protein (CRP), albumin, and hemoglobin were measured. Standard echocardiography assessed left ventricular mass (LVM), global longitudinal strain (GLS), interventricular septum thickness (IVS), left ventricular end-diastolic diameter (LVEDD), and right ventricular diameter (RVD). Spearman correlations and multivariate regression explored associations between cytokines and echocardiographic remodeling.

Results. Median IL-6 was 7.36 pg/mL (IQR 4.52–11.03) and TNF-α 9.35 pg/mL (IQR 7.9–12.57). IL-6 strongly correlated with LVM ($\rho = 0.63$, $p < 0.001$), RVD ($\rho = 0.53$, $p < 0.001$), and CRP ($\rho = 0.52$, $p < 0.001$). In contrast, TNF-α showed an inverse association with LVM ($\rho = –0.36$, $p = 0.006$). Multivariate regression identified LVM ($p = 0.019$) and RVD ($p = 0.042$) as independent predictors of IL-6, whereas TNF-α was predicted by age ($p < 0.001$), CRP ($p = 0.038$), and albumin ($p = 0.012$).

Conclusions. IL-6 was more consistently associated with echocardiographic hypertrophy and right-sided dilation than TNF-α, suggesting it may serve as a more informative biomarker of subclinical cardiac remodeling in HD patients. These findings support prioritizing IL-6 in future studies evaluating inflammation-driven cardiovascular risk in ESRD.

OP-21 Experience of using medium cut-off membranes in Multiple myeloma- related acute kidney injury: A case series presentation

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Introduction. Acute kidney injury (AKI) in Multiple myeloma (MM) patients is frequently precipitated by excessive free light chains (FLC) deposition, leading to tubular obstruction and inflammation. Standard hemodialysis (HD) is ineffective in removing these large molecules, whereas high cut- off (HCO) membranes have shown promise but with limitations such as albumin loss. Medium cut- off (MCO) membranes, designed for enhanced middle-molecule clearance up to 45 kDa with minimal albumin leakage, may offer a novel therapeutic approach.

Case report. We report on five cases with MM who developed AKI and were treated with MCO-HD and specific chemotherapy with Bortezomib on our clinic. Initially, 4 hours sessions were conducted using a 1.7/2.0 m^2 MCO filter, followed by 6 hours sessions, every other day.

Outcome. Four of our patients were male and the mean age of our cases was 70,2 (65- 77) years. The mean Reduction Ratio (mRR) of lambda (λ-FLC) was: 40% in the first patient, 33%, of the second and 42% of the third, mRR of kappa (k-FLC) was 75% of the fourth patient and 69% for the fifth patient, respectively, without a significant reduction in the plasma albumin levels. Tree out of five patients recovered renal function becoming independent of HD.

The mean eGFR of the three patients who recovered kidney function after treatment with specific chemotherapy and MCO-HD increased from 15 ml/min/1.73m^2 at the end of MCO-HD sessions to 61 ml/min/1.73m^2 (range 48-75 ml/ min/1.73m^2) three months afterwards.

Conclusion. The combined and early initiated treatments of chemotherapy plus MCO-HD sessions are effective in reducing the levels of both FLC and sufficient recover of renal function, allowing significant savings, better quality of life and longer life span.

OP-22 Peritoneal dialysis-related infections in a national network: a 30-month multicenter study from Romania

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Introduction. Peritoneal dialysis (PD) remains underutilized in Eastern Europe, where infectious complications represent a major barrier to technique survival. The most frequent infections are peritonitis and exit-site infections (ESI), both targeted by ISPD quality indicators (<0.5 and <0.4 episodes/patient-year, respectively). Reliable multicenter data from national programs in the region are scarce. This study aimed to evaluate the incidence, microbiological profile, antimicrobial resistance, and clinical outcomes of PD-related infections in a Romanian national dialysis network.

Methods. We retrospectively analyzed all confirmed peritonitis and ESI episodes between January 2023 and June 2025 in 14 dialysis centers, including 75 patients on PD. Data collected included infection type, microbiological etiology (Gram-positive, Gram-negative, fungal), antimicrobial resistance, and outcomes (catheter retention/removal, transfer to hemodialysis, infection-related mortality). Incidence rates were calculated per patient-year at risk.

Results. A total of 57 PD-related infections were recorded during the 30-month observation period: 46 ESIs and 11 peritonitis episodes. Exit-site infections: Gram-positive organisms predominated (Staphylococcus aureus MSSA/MRSA, S. epidermidis), while Gram-negative isolates were rare and no fungal pathogens were identified. Three multidrug-resistant organisms (MDROs) were documented overall. No catheter removals were required and no episodes progressed to peritonitis. The cumulative ESI incidence was 0.27 episodes/patient-year, below the ISPD benchmark of 0.4.

Peritonitis: Eleven episodes were identified, with Gram-negative bacteria being most frequent (6/11, mainly Escherichia coli), followed by Gram-positive organisms (4/11, including MRSA) and one fungal infection (Candida spp.). One MDRO case was recorded. All patients responded to targeted therapy, with no infection-related deaths. The overall peritonitis incidence was 0.18 episodes/patient-year, meeting ISPD targets (<0.5).

Conclusion. This is the first 30-month multicenter analysis of PD-related infections performed in a Romanian national dialysis network. Our findings demonstrate that ISPD-based preventive protocols—exit-site care, MRSA screening and decolonization, structured patient and caregiver education, and culture-guided antimicrobial therapy—can achieve and sustain benchmark infection rates in a multicenter setting. Importantly, no catheter losses and no infection-related mortality occurred. These results provide a benchmark for PD programs in Eastern Europe and support the expansion of PD as a sustainable dialysis modality when standardized infection control strategies are systematically applied.

OP-23 Viral infections and co-infections rates of Cytomegalovirus, Epstein-Barr virus and BK

polyomavirus in kidney transplant patients a single center study.

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Introduction. Viral infections are among the most common and serious complications after kidney transplantation, contributing to morbidity and graft loss. The most significant viral pathogens are Cytomegalovirus, Epstein-Barr virus, and BK polyomavirus, which may occur as isolated infections or as coinfections. Data on their frequency and clinical significance among kidney transplant population in North Macedonia is limited. Our aim was to determine the frequency of viral infections and rates of coinfection among kidney transplant recipients as well as their impact on graft function and clinical outcomes.

Methods. We conducted a prospective interventional study of 43 kidney transplant recipients at the University Clinic of Nephrology, Skopje, between January 2023 and December 2024. Data were analyzed from the electronic medical records of the transplant department, including routine follow-up visits and consultations for symptoms. All received induction therapy (Anti-thymocyte globulin or Basiliximab) followed by triple immunosuppressive therapy, steroids, mycophenolic acid and calcineurin inhibitors (tacrolimus or cyclosporin A). Biochemical analyses and virological monitoring with Polymerase Chain Reaction for Cytomegalovirus, Epstein-Barr virus, and BK polyoma virus were performed. In cases with Cytomegalovirus with copies > 300 copies/mL and symptoms Vangancyclovir was used as a treatment, while in Epstein-Barr virus and BK polyomavirus positivity, immunosuppressive therapy was modified. The association with renal function, hospitalization and graft survival was also assessed.

Results. Mean age of patients was 41.7±12.9 years, 72.1% were male and 27.9% female. Among the 43 transplant recipients, Cytomegalovirus infection was detected in 20.9% of patients with >300 copies/mL, EBV was not detected in any patient, and BK polyomavirus was detected in 9.3% with >300 copies/mL. Coinfection with at least two viruses was observed in 2.33% of patients, that being Cytomegalovirus + BK virus. Only 16.7 % of patients with detectable Cytomegalovirus were asymptomatic and were not treated, rest had impaired graft function and were treated with oral Valganciclovir. Graft function improved in all treated patients except in one patient with Cytomegalovirus+BKvirus coinfection, who experienced irreversible graft loss and remained on hemodialysis treatment. Three patients died, in two of them beside Cytomegalovirus, bacterial and fungal coinfections were present.

Conclusion. Our study concluded that Cytomegalovirus and BK virus infections are frequent complications after kidney transplantation, Cytomegalovirus being the most frequent. Patients with coinfections had significantly more severe graft dysfunction, higher hospitalization rates and worse clinical outcomes. Regular protocol-based monitoring and individualized adjustment of immunosuppressive therapy are essential for early detection and treatment, aiming to improve graft and patient survival.

OP-24 The implantable artificial kidney

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Introduction. The Implantable Artificial Kidney (IAK) is an impressive example of biomedical engineering (bionics) and nanotechnology, combining mechanical filtration and biological functions into a miniaturized device which can function inside the human body without requiring an external energy source or daily maintenance, as is the case for haemodialysis. This article aims to analyze the major components of the implantable artificial kidney.

Methods. This study analyzed the nanotechnology-based mechanical filter (a detailed analysis of silica membranes with controlled porosity) and the cellular bioreactor - composed of living cells which perform complex biological functions (absorption, secretion, hormone regulation), as well as its connection to transhumanism (the replacement of biological functions with advanced technological systems), which require in this case the following: overcoming the natural limits of a functioning biological organ, integrating within the body a mechanical device which then becomes a part of human anatomy and physiology, and its autonomy, in the sense that it does not require an energy source. The article also analyzes the current stage, in 2025, of preclinical development of the implantable artificial kidney (the results of animal testing and studies), as well as the perspective of starting clinical trials.

Results. The implantable artificial kidney is an applied example of medical transhumanism, in which human biology is supplemented or replaced with advanced technology, not only for the purpose of treating a disease, but also to change the way in which we understand the limits of the human body.

Conclusion. The implantable artificial kidney is a bridge between classic medicine and the future of the augmented man, which may require improving basal medicine education by supplementing with elements of artificial intelligence, bionics and quantum physics.

OP-25 Typical vs. atypical hemolytic uremic syndrome in children

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Introduction. Typical hemolytic uremic syndrome (HUS) and atypical Hemolytic Uremic Syndrome (aHUS) are part of the thrombotic microangiopathies (TMA). They are characterized by thrombocytopenia, hemolytic anemia, acute kidney injury, cerebral involvement. HUS occurs frequently after a diarrheal disease, especially from E. coli that produces Shiga toxin (STEC). For aHUS the underlying cause is the uncontrolled activation of the complement system. The aim of our study was to determine the main characteristics of these diseases in children and how to promptly diagnose them for proper treatment.

Methods. A retrospective observational analysis was performed at the "Louis Turcanu" Emergency Hospital for Children in Timisoara, Romania, during a 10-year period. Data were collected from the electronic medical records of the patients.

Results. We identified 37 patients: 25 diagnosed with HUS, from which 68% were STEC-HUS, 36% of them required Renal Replacement Therapy (RRT), 3 deaths occurred in this lot due to severe neurological involvement. In May 2025, 2 patients tested positive for STEC-serogroup O26, and were part of the HUS outbreak in Romania. All survivors recovered renal function, the average hospitalization duration was 20.72 days (ranging from 2 to 64 days). Two of the 12 aHUS patients presented infectious prodrome, 67% of them required RRT, no deaths were recorded, 2 underwent kidney transplant, 1 progressed to chronic kidney disease. Mean length of hospitalization was 25.66 days (range 5 to 60 days). In the past two years, Eculizumab was given as fast as 24 hours after admission, reducing red blood cell transfusions, RRT, and hospitalization days (median lowered from 19.5 days to 12 days). We did not perform plasmapheresis on any patients; studies have not demonstrated any benefit for the pediatric population. To confirm the diagnosis, Semmelweis Immunology Institute Budapest evaluated all aHUS patients for complement dysregulation. One had a pathogenic mutation, medium risk group, necessitating Eculizumab continuation.

Conclusion. Rapid identification of HUS and aHUS drastically reduces mortality and increases the chance of renal function recovery. In case of aHUS, it is important to administer the targeted therapy in the first days after the onset. A quick referral to the pediatric nephrologist in case of suspected HUS/aHUS can improve the child's outcome.

OP-26 Clinical significance of serum VEGF and TGF- β1 levels in urinary tract infections in infants and young children

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Introduction. Urinary tract infections (UTIs) are among the most common pediatric conditions, with the potential to progress to permanent kydney damage, especially in young children. Early identification of biomarkers such as *Vascular Endothelial Growth Factor,* (VEGF) and *Transforming Growth Factor Beta 1* (TGF-β1) plays an important role in inflammatory processes and tissue remodeling, which can significantly improve diagnostic and therapeutic strategies. To evaluate serum levels of VEGF and TGF-β1 in children with UTI in order to identify their role as biomarkers of renal impairment and inflammatory and fibrotic processes.

Methods. This prospective study included 180 children, divided into three groups: children aged 3 months–1 year and 1–3 years diagnosed with UTI, and a control group of healthy children. Serum levels of VEGF and TGF-β1 were measured using the ELISA method.

Results. The study results showed a significant decrease in VEGF levels in children with UTI compared to the control group. Thus, the mean serum VEGF values were 526.50 ± 29.36 pg/ml in children aged 3–12 months with UTI, and 568.15 ± 48.50 pg/ml in the 1–3 years group, compared to 708.11 ± 65.50 pg/ml in the control group. The reduction in VEGF levels indicates impairment of vascular regeneration and angiogenesis, which may contribute to the persistence of kidney inflammation and delayed healing. Serum TGF-β1 values were similar between the control group and children under 1 year of age (22.81 ± 1.44 pg/ml vs. 22.78 ± 1.02 pg/ml), but in the 1–3 years group a significant increase was recorded (58.44 ± 8.35 pg/ml). Changes in TGF-β1 may indicate the initiation of an early, potentially reversible kidney fibrotic process if appropriate therapeutic intervention is applied. TGF-β1 is known as a key mediator of fibrogenesis and epithelial-mesenchymal transition, being involved in renal remodeling and scarring.

Conclusion. Serum levels of VEGF and TGF-β1 change specifically in UTI, providing valuable information about the inflammatory status and risk of renal injury. VEGF may reflect vascular status and the degree of renal hypoxia, while TGF-β1 may serve as an early marker of renal fibrogenesis initiation. Incorporating these biomarkers into diagnostic algorithms contributes to risk stratification of kidney

damage and optimization of treatment according to severity. The use of these biomarkers can improve clinical assessment and prognosis in children with UTI.