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1. **Assessment of Nutritional Status Using Body Composition Analysis in Cardiac Surgery and Risk Association with Acute Kidney Injury.**

Authors: Abraham G.;Nagarajan V.;Mathew M.;Alex M.E.;Jain K. and Mogga, P.

Publication Date: 2025

Journal: The Journal of the Association of Physicians of India 73(10), pp. 28–32

Abstract: Poor nutritional status prior to surgery in cardiac patients is one of the risk factors for acute kidney injury (AKI), morbidity, and mortality. There is a lack of data in patients undergoing cardiac surgery with regard to nutritional status and risk of AKI. This study was conducted with the objective of assessment of the nutritional status of cardiac surgery patients using body composition measures (BCM) and other biochemical parameters. This study was conducted at Madras Medical Mission Hospital, Chennai. Before enrolling, informed consent from the patients and ethical authorization were obtained. All patients >18 years of age undergoing cardiac surgery had a BCM analysis done on the pre- and postoperative day 5. Paired t-test was used to compare the pre- and postoperative data. Preoperative body mass index (BMI) of the patients showed that the majority of them were overweight, with a mean BMI of +/-26.55 kg/m2. There were no significant changes in the BCM results for protein weight in either study group (no AKI group-preop: mean +/- SD, 9.0316 +/- 2.39, p = 0.67; postop: mean +/- SD, 9.1919 +/- 2.57, p = 0.77; AKI group-preop: mean +/- SD, 9.57 +/- 8.00, p = 0.67; postop: mean +/- SD, 9.56 +/- 8.07, p = 0.77). There was a significant loss of body fat in all patients, but it was higher in patients who developed AKI (preop: mean +/- SD, 33.28 +/- 10.96, p = 0.11 vs postop: mean +/- SD, 31.83 +/- 10.94, p = 0.53). The skeletal muscle mass in both groups showed no significant changes. Those who developed AKI postoperatively had a higher preoperative visceral fat area (VFA) (mean +/- SD, 116.87) and percentage body fat (PBF) (33%) compared to patients who did not develop AKI (VFA +/-102.36 and PBF 30%). We found that patients had lost body fat postsurgically. Those who

were diagnosed with AKI had overhydration, high waist circumference, and VFA preoperatively.

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2. **Outcomes of acute kidney injury in patients receiving extracorporeal membrane oxygenation during the COVID-19 pandemic: a prospective, observational, and multi-center study.**

Authors: AlSahow, Ali;Alkandari, Omar;AlRajab, Heba;AlHelal, Bassam;AlYousef, Anas;AlQallaf, Ahmed;Bahbahani, Yousif;AlKandari, Abdulrahman;Nessim, Gamal;Mashal, Bassem;Mazroue, Ahmad;ElAbbadi, Mohamed;Abdelmoteleb, Alaa;Abdelzaher, Ali;Abdellatif, Mohamed;ElHusseini, Ziad;Abdelrady, Ahmed and Abdalla, Emad

Publication Date: Dec ,2025

Journal: Renal Failure 47(1), pp. 2570817

Abstract: INTRODUCTION: Extracorporeal membrane oxygenation (ECMO) is a life-saving therapy in severe respiratory and/or cardiovascular failure. Acute kidney injury (AKI) is a frequent complication of ECMO that increases morbidity and mortality. We report the outcomes of patients with AKI who received ECMO. METHODS: Clinical, management, and 30-d kidney and patient outcome data of adult inpatients with AKI who received ECMO in seven public hospitals in Kuwait from 1 January to 31 December 2021, were prospectively collected and analyzed. RESULTS: There were 3,744 AKI referrals to nephrology during study period, of which 121 received ECMO (3.2%). Patients with AKI on ECMO had a mean age of 56.3 years and a mean baseline eGFR of 81.6 mL/min. Preexisting chronic kidney disease was reported in 21.5% of patients, diabetes in 58.7%, and hypertension in 48%. COVID-19 infection contributed to AKI in 69% of the cases. AKI developed before ECMO initiation in 62% of cases. ECMO was veno-venous in 90% of cases. Dialysis was performed in 92% of cases, 97% of which was continuous modality. Mechanical ventilation was required in 94.2% of patients (all on inotropic support). At 30 d, 86.8% of the cohort died (91% of the deceased were on dialysis), 5% remained on dialysis, and only 3.3% recovered kidney function completely. CONCLUSIONS: AKI in patients receiving ECMO was associated with a high need for dialysis, and a high mortality rate. COVID-19 pandemic may have contributed to this outcome. ECMO modality, and whether AKI was pre or post ECMO did not affect the outcome.

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3. **Incidence and Risk Factors for Acute Kidney Injury After Spine Surgery.**

Authors: Castillo H.;Lingampalli N.;Ekweariri N.R.;Baksh N. and Wojewnik, B.

Publication Date: 2025

Journal: Clinical Spine Surgery (pagination), pp. Date of Publication: 07 Oct 2025

Abstract: STUDY DESIGN: This was a retrospective review using the ACS-NSQIP database. OBJECTIVE(S): To investigate the incidence of acute kidney injury (AKI) in elective spine surgery and identify risk factors associated with its development. SUMMARY OF BACKGROUND DATA: Spine surgery is the most common type of surgery in the United States, with AKI being a frequent postoperative complication. AKI is linked to increased morbidity, prolonged hospital stays, and higher costs. However, limited data exist on specific risk factors for AKI in spine surgery patients. METHOD(S): Patients undergoing elective spine surgery were identified using CPT codes from the ACS-NSQIP database. AKI was defined based on perioperative laboratory values. Propensity matching was applied to identify associated risk factors. Univariate and multivariate analyses were performed on the matched cohort to assess preoperative characteristics and postoperative outcomes. RESULT(S): Among 351,998 elective spine procedures, the incidence of postoperative AKI was 0.10% (373 patients). AKI patients were more likely to be non-Hispanic Black (14.7% vs. 9.5%, P=0.033), have a higher BMI (33.2 vs. 31.5, P=0.006), anemia (49.3% vs. 33.6%, PRESULT(S): Among 351,998 elective spine procedures, the incidence of postoperative AKI was 0.10% (373 patients). AKI patients were more likely to be non-Hispanic Black (14.7% vs. 9.5%, P=0.033), have a higher BMI (33.2 vs. 31.5, P=0.006), anemia (49.3% vs. 33.6%, PRESULT(S): Among 351,998 elective spine procedures, the

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4. **Outcomes In Acute Kidney Injury Requiring Haemodialysis - A Retrospective Cohort Study.**

Authors: Chetcuti S. and Masengu, A.

Publication Date: 2025

Journal: Ulster Medical Journal 94(2), pp. 77–82

Abstract: Background Acute kidney injury (AKI) requiring intermittent haemodialysis (AKI-IHD) is associated with significant morbidity and high mortality. There is limited data regarding clinical outcomes in individuals with AKI-IHD in Northern Ireland. The aim of this study was to explore clinical outcomes in a cohort of individuals with AKI-IHD, including rates of recovery to self-sustaining kidney function, mortality rates at 30 days and 2 years from start of haemodialysis, and to investigate potential predictors of these key outcomes. Methods The Acute Haemodialysis Unit in the Royal Victoria Hospital, Belfast, Northern Ireland, was established in 2011 to provide onsite inpatient intermittent haemodialysis (IHD) to individuals requiring this supportive treatment. A retrospective review of 188 incident IHD patients in the Royal Victoria Hospital from January 2018-December 2022 was undertaken. Demographic and clinical outcome information on 12th May 2023 was obtained from the nephrology electronic database eMed (Mediqal) and the Northern Ireland Electronic Care Record. Results 188 individuals commenced IHD for the first time as a consequence of life-threatening complications of AKI during the 5-year period (January 2018-December 2022). 75% of these patients were not previously known to the nephrology service, (GROUP A, n=142, mean age 63 years, mean baseline serum creatinine 99 micromol/L) while 25% (GROUP B, n=46, mean age 67 years, mean baseline creatinine 278 micromol/L) had been attending a Nephrology Clinic for at least 12 months. A significant proportion of AKI developed during the inpatient admission rather than at initial presentation (GROUP A 47%, GROUP B 50%). 92% of GROUP A recovered self-sustaining kidney function before discharge, compared to 59% of GROUP B. A lower baseline serum creatinine was the only predictor of kidney recovery in GROUP B, p value=0.02. No predictors for kidney recovery were identified in GROUP A. The diagnosis of either AKI and/or dialysis was documented in 80% of electronic discharge letters for patients in GROUP A but only 54% of letters for patients in GROUP B. The 30-day mortality (from IHD start) in GROUP A was 14% compared to 9% in GROUP B. Individuals with a diagnosis of heart failure were four times more likely to die before discharge (p value=0.02) and those aged >= 70 years twice as likely to die before discharge (p value=0.049). The two-year mortality rate in the two groups was similar (GROUP A 35% vs. GROUP B 37%) despite GROUP B being significantly older. Conclusion In this cohort of individuals with AKI-IHD, managed in the Royal Victoria Hospital, Belfast, the majority recovered self-sustaining kidney function. The mortality rates at 30 days were lower than reported in the literature and may be due to careful patient selection. The poorer outcomes associated with AKI-IHD support and a concomitant diagnosis of heart failure or age >= 70 years (or both) are useful in guiding clinical and patient expectations and decision making.

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5. **Impact of early acute kidney injury on 30-day mortality in intensive care unit patients with chronic obstructive pulmonary disease: a retrospective study using MIMIC-IV.**

Authors: Chi C.;Zhou J. and Hou, S.

Publication Date: 2025

Journal: Journal of Thoracic Disease 17(9), pp. 6404–6415

Abstract: Background: Chronic obstructive pulmonary disease (COPD) is one of the leading causes of death worldwide, and acute kidney injury (AKI) is one of the most common comorbidities in patients with COPD. However, the impact of AKI occurring within 2 days of COPD diagnosis is unclear. Therefore, this study aimed to assess the impact of a 2-day onset of AKI on COPD patient outcomes using the Medical Information Mart for Intensive Care-IV (MIMIC-IV) database. Method(s): This retrospective study is based on version 2.2 of the MIMIC-IV database. We collected clinical data and 30-day all-cause mortality data for patients with COPD in the intensive care unit (ICU), who met the diagnostic criteria for COPD upon admission between 2008 and 2019. We used the International Classification of Diseases, 10th Revision (ICD-10) (codes J44, J440, J441, and J449) to identify COPD. Kaplan-Meier analysis was used to compare 30-day all-cause mortality in COPD patients with and without 2-day AKI. A Cox proportional hazards model was employed to investigate risk factors associated with 30-day all-cause mortality in COPD patients. Result(s): This study included 2,609 patients with COPD, of whom 1,514 (58.03%) developed AKI within 2 days, while 1,095 (41.97%) did not. Patients with COPD, those who developed AKI within 2 days were older than those who did not develop AKI within 2 days [median: 72.7 (65.1, 80.0) vs. 70.6 (63.2, 79.6), P=0.005] and had a higher Simplified Acute Physiology Score III (SAPSIII) score [median: 50.0 (37.0, 67.8) vs. 37.0 (28.0, 48.0), PResult(s): This study included 2,609 patients with COPD, of whom 1,514 (58.03%) developed AKI within 2 days, while 1,095 (41.97%) did not. Patients with COPD, those who developed AKI within 2 days were older than those who did not develop AKI within 2 days [median: 72.7 (65.1, 80.0) vs. 70.6 (63.2, 79.6), P=0.005] and had a higher Simplified Acute Physiology Score III (SAPSIII) score [median: 50.0 (37.0, 67.8) vs. 37.0 (28.0, 48.0), PResult(s): This study included 2,609 patients with COPD, of whom 1,514 (58.03%) developed AKI within 2 days, while 1,095 (41.97%) did not. Patients with COPD, those who developed AKI within 2 days were older than those who did not develop AKI within 2 days [median: 72.7 (65.1, 80.0) vs. 70.6 (63.2, 79.6), P=0.005] and had a higher Simplified Acute Physiology Score III (SAPSIII) score [median: 50.0 (37.0, 67.8) vs. 37.0 (28.0, 48.0), PResult(s): This study included 2,609 patients with COPD, of whom 1,514 (58.03%) developed AKI within 2 days, while 1,095 (41.97%) did not. Patients with COPD, those who developed AKI within 2 days were older than those who did not develop AKI within 2 days [median: 72.7 (65.1, 80.0) vs. 70.6 (63.2, 79.6), P=0.005] and had a higher Simplified Acute Physiology Score III (SAPSIII) score [median: 50.0 (37.0, 67.8) vs. 37.0 (28.0, 48.0), PConclusion(s): The occurrence of 2-day AKI was an independent risk factor for 30-day all-cause mortality in patients with COPD. Clinically, these findings highlight the importance of providing early kidney protection for patients with COPD.

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6. **Discovery of a resistant cohort to acute kidney injury: insights from patients with septic shock.**

Authors: Fuhrman D.Y.;Libermann T.A.;Hukriede N.A.;Molinari L.;Parikh S.M. and Kellum, J. A.

Publication Date: 2025

Journal: Critical Care 29(1) (pagination), pp. Article Number: 427. Date of Publication: 01 Dec 2025

Abstract: Background: Acute kidney injury (AKI) is a significant complication among critically ill patients, particularly those with sepsis, yet no specific therapies exist. Progress in some diseases has been achieved by analyzing individuals who appear resistant. This study sought to develop a framework to investigate AKI resistance using clinical phenotyping and biomarkers and applied this framework to a large cohort of patients with septic shock. Method(s): We performed a retrospective

analysis of patients enrolled in the Protocolized Care for Early Septic Shock (ProCESS) trial. We measured urinary tissue inhibitor of metalloproteinase-2 (TIMP-2), insulin-like growth factor binding protein 7 (IGFBP7), and kidney injury molecule 1 (KIM-1) 6 h after the start of resuscitation. AKI was defined first as high risk by [TIMP-2]*[IGFBP7] > 1.0 (ng/mL)2/1000 and either meeting Kidney Disease Improving Global Outcomes Criteria (KDIGO) criteria within 7 days after the start of resuscitation or having [KIM-1] > 2.0 ng/ml. AKI resistance was defined as the combination of (a) high-risk by [TIMP-2]*[IGFBP7] > 1.0 (ng/mL)2/1000 but without meeting (b) KDIGO AKI criteria nor (c) [KIM-1] > 2.0 ng/ml. We compared clinical characteristics and outcomes across three groups: AKI-resistant, AKI, and reduced risk, which was defined as [TIMP-2]*[IGFBP7] Method(s): We performed a retrospective analysis of patients enrolled in the Protocolized Care for Early Septic Shock (ProCESS) trial. We measured urinary tissue inhibitor of metalloproteinase-2 (TIMP-2), insulin-like growth factor binding protein 7 (IGFBP7), and kidney injury molecule 1 (KIM-1) 6 h after the start of resuscitation. AKI was defined first as high risk by [TIMP-2]*[IGFBP7] > 1.0 (ng/mL)2/1000 and either meeting Kidney Disease Improving Global Outcomes Criteria (KDIGO) criteria within 7 days after the start of resuscitation or having [KIM-1] > 2.0 ng/ml. AKI resistance was defined as the combination of (a) high-risk by [TIMP-2]*[IGFBP7] > 1.0 (ng/mL)2/1000 but without meeting (b) KDIGO AKI criteria nor (c) [KIM-1] > 2.0 ng/ml. We compared clinical characteristics and outcomes across three groups: AKI-resistant, AKI, and reduced risk, which was defined as [TIMP-2]*[IGFBP7] Result(s): Among 573 patients, 339 (59.2%) had reduced risk, 194 (33.9%) developed AKI, and 40 (7%) were AKI-resistant. Median (IQR) non-renal SOFA scores were lower for patients at reduced risk for AKI (5 [2-7]) than for those with AKI resistance (6 [4.5-8], P Result(s): Among 573 patients, 339 (59.2%) had reduced risk, 194 (33.9%) developed AKI, and 40 (7%) were AKI-resistant. Median (IQR) non-renal SOFA scores were lower for patients at reduced risk for AKI (5 [2-7]) than for those with AKI resistance (6 [4.5-8], P Result(s): Among 573 patients, 339 (59.2%) had reduced risk, 194 (33.9%) developed AKI, and 40 (7%) were AKI-resistant. Median (IQR) non-renal SOFA scores were lower for patients at reduced risk for AKI (5 [2-7]) than for those with AKI resistance (6 [4.5-8], P Conclusion(s): Despite greater illness severity, AKI-resistant patients had similar mortality and length of stay as lower-risk patients but better outcomes than those with AKI. Studying these patients may reveal novel therapeutic targets for AKI prevention and treatment.Copyright © The Author(s) 2025.

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7. **The Prevalence, Risk Factors, and Short-Term Health Outcomes of Delirium in Patients Admitted to a Nephrology Ward in Eastern Europe: An Observational Prospective Cohort Study.**

Authors: Gadalean, Florica;Petrica, Ligia;Milas, Oana;Bob, Flaviu;Parv, Florina;Gluhovschi, Cristina;Suteanu-Simulescu, Anca;Marcu, Lavinia;Glavan, Mihaela;Ienciu, Silvia;Kigyosi, Raluca and Stanigut, Alina

Publication Date: Oct 16 ,2025

Journal: Journal of Clinical Medicine 14(20)

Abstract: Background/Objectives: To date, delirium is considered one of the most frequent acute neuropsychiatric syndromes among hospitalized populations, although there is a lack of data regarding its frequency and predictors in nephrological patients. The aims of this study were to investigate the prevalence of and the risk factors for delirium and to evaluate the association between delirium and short-term clinical outcomes, including the length of stay (LOS) and in-hospital mortality rate among patients from the nephrology unit of a tertiary university hospital in Eastern Europe. Method: A cohort of 942 patients admitted between January 2023 and December 2023 were enrolled in a prospective observational study. Delirium was diagnosed by a psychiatrist during hospitalization. The endpoint was defined as hospital death or hospital discharge. Results: In the studied group, the median age was 65 years, and 519 (55.09%) patients were males. The prevalence of delirium was 5.41% (51/942 patients). The patients with delirium had a significantly longer LOS (11.96 days vs. 8.86 days, p = 0.007) and a significantly higher in-hospital mortality rate (47.05% vs. 14.36%, p p = 0.034), history of stroke (OR = 3.493; 95%CI: 1.849-6.598; p p = 0.001), and AKI stages 2 and 3 (OR = 2.175; 95%CI: 1.152-4.105; p = 0.017). From a time-to-event analysis, delirium was associated with increased mortality (HR = 2.77; 95%CI: [1.79 to 4.29]; p p =0.024). Conclusions: Among nephrological patients, age, alcohol abuse, history of stroke, and AKI stages 2 and 3 were independent risk factors for delirium. Delirium

significantly increased the LOS and in-hospital mortality.

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8. **Severe Acute Kidney Injury Associated With Intestinal Ostomies.**

Authors: Gomez-Fregoso, Juan A.;Zaragoza, Jose J.;Gonzalez-Duarte, Juan Alberto;Nuno-Guzman, Carlos M.;Hernandez-Barajas, Eduardo M.;Andrade-Jorge, Zarahi;Leon, Juarez Correa-de;Padilla-Armas, Jorge L.;Ornelas-Ruvalcaba, Rebeca Lizzete;Cabrera-Aguilar, Jose Said;Chavez-Alonso, Gael;Villalvazo-Maciel, Estefania;Orozco-Chan, Carlos E.;Rodriguez-Garcia, Gonzalo;Navarro-Blackaller, Guillermo;Medina-Gonzalez, Ramon;Gallardo-Gonzalez, Alejandro Martinez;Alcantar-Vallin, Luz;Abundis-Mora, Gabriela J.;Garcia-Garcia, Guillermo, et al

Publication Date: Oct ,2025

Journal: Kidney Medicine 7(10), pp. 101093

Abstract: Rationale & Objective: People with ostomies can experience high output, a risk of acute kidney injury (AKI). We evaluated patients with AKI associated with ostomies (ostomy-AKI) and compared with AKI of other etiologies (general-AKI) with the objective of describing their clinical presentation and their association with major adverse kidney events at 10 and 30-90 days (major adverse kidney events [MAKE] 10 and 30-90, respectively). Study Design: A retrospective cohort study. Setting & Participants: Conducted at the Hospital Civil of Guadalajara. We included patients with Ostomy-AKI and General-AKI. Exposures or Predictors: Ostomy-AKI. Outcomes: Describing and differentiating their clinical presentation and their association with MAKE 10 and MAKE 30-90, in addition to its individual components, as death, new requirement for dialysis, or >=25% decline in the estimated glomerular filtration rate from baseline. Analytical Approach: Analyzed the risk by logistic regression model and a multivariate Cox proportional hazard. Results: From February 2020 to October 2023, 84 patients with ostomy-AKI and 348 with general-AKI were included. Most ostomy-AKI were male (78.7 vs 56.2%), the mean ostomy output was 980 mL/day (760-1,700), 82.9% requiring fluid adjustment. Ostomies had been created for cancer (46%) 2.3 months before AKI. The etiology of ostomy-AKI, compare to general-AKI, was more frequently due to hypovolemia (48.9% vs 24.5%) and was of greater AKI severity (stage 3, 82.9% vs 63.9%). Both groups had the same frequency of MAKE 10 (94%), and their individual components. MAKE 30-90 occurred more frequently in ostomy-AKI (65.9% vs 49.3%) as well as mortality (59.5% vs 37%), doubling this risk (OR 2.403; 95% CI, 1.090-5.299; P = 0.03 and OR 2.757; 95% CI, 1.273-5.973; P = 0.01, respectively). Limitations: A retrospective cohort, residual confounding, and small sample size. Conclusions: In comparison with general-AKI, patients with ostomy-AKI present more often with hypovolemia and greater AKI stage, had a higher mortality at 30-90 day follow-up, and a 2.5-fold increase in risk of MAKE. Copyright © 2025 The Authors.; plain-language-summary Hypovolemia is a frequently observed in patients with high output ostomy. In such cases, the risk of developing acute kidney injury (AKI) is elevated. This complication is strongly related to adverse clinical outcomes. However, the major adverse kidney events during mid-term follow-up have not been adequately explored. In this cohort of patients with AKI, we observed that those with ostomy-related AKI, compared with those without ostomy presented more frequent with hypovolemia attributed to a high output stoma and more severe AKI stages. The risk of major adverse kidney events at 30-90 days was significantly higher, particularly in terms of mortality. Language: English

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9. **Acute kidney injury in very old patients-incidence, severity, risk factors and short-term outcomes.**

Authors: HergetRosenthal S.;Stille K.;Albrecht K.;Findeisen H.;Scharpenberg M. and Kribben, A.

Publication Date: 2025

Journal: Nephrology Dialysis Transplantation 40(10), pp. 1949–1960

Abstract: Background and hypothesis. Although old age is a risk factor for acute kidney injury (AKI), data on AKI in individuals >=80 years is limited. We aimed to provide data on AKI incidence, severity

and outcomes to identify risk factors for AKI and 30-day mortality in those >=80 years old. Methods. This was a cohort study of 2132 patients admitted to hospital. AKI was defined and classified by extended KDIGO criteria to detect community-acquired AKI, frailty as a clinical frailty score >=5. Primary endpoints were AKI and its stages, secondary endpoints 30-day mortality and major adverse kidney events (MAKE30), a composite of mortality, new renal replacement therapy or serum creatinine values >=200% of baseline, all at 30 days. Results. Median age was 86 years. AKI was frequent (35.3%) and predominately community-acquired (80.2%). The incidence rate of AKI rose with increasing age, reaching the maximum in patients 95 years old. Some 48.9% of AKI patients developed stage 1, while 27.0% and 24.1% reached stages 2 and 3, respectively. Frailty was identified as an independent AKI risk factor {adjusted odds ratio (aOR) 2.42 [95% confidence interval (CI) 1.93-3.03]}. The 30-day mortality rate was significantly higher in AKI compared with non-AKI patients (25.4% vs 7.6%), 44.4% of AKI patients developed MAKE30. Among others, AKI and frailty were risk factors for 30-day mortality [aOR 3.02 (95% CI 2.25-4.07) and 1.53 (95% CI 1.16-2.02)], with frailty exceeding AKI in patients >=90 years. Conclusions. AKI occurs frequently, increases with age, is severe and is predominately community-acquired in individuals >=80 years admitted to hospital. Frailty is a risk factor for AKI besides established factors. Very old patients with AKI more frequently died or developed a high rate of the composite endpoint MAKE30. AKI and frailty are risk factors for 30-day mortality. The effect of frailty on mortality exceeded that of AKI in nonagenarians.

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10. **Sex-specific AKI risk in acute myocardial infarction patients with type 2 diabetes mellitus.**

Authors: Huang, Xiaorui;Wang, Haichen and Yuan, Wei

Publication Date: 2025

Journal: Frontiers in Endocrinology 16, pp. 1654587

Abstract: Background/objectives: While sex differences in cardiovascular outcomes are recognized, their role in the risk and clinical outcomes of acute kidney injury (AKI) among acute myocardial infarction (AMI) comorbid with type 2 diabetes mellitus (T2DM) remains unstratified in clinical guidelines. The aim of this study is to explore the sex differences in the occurrence of AKI among AMI-T2DM patients, so as to provide ideas for the precision management of these patients. Methods: This retrospective cohort study enrolled AMI patients with T2DM from The First Affiliated Hospital of Xi'an Jiaotong University from 2018 to 2022. Clinical data and medication information were collected through the hospital's biospecimen information resource center. Patients enrolled were divided into male group and female group. The primary outcome is AKI during hospitalization. Results: Among 2,631 AMI patients complicated with T2DM (76.1% male, median age 67.0 years (55.9-78.1), acute kidney injury occurred in 13.3% (n = 351) of the cohort. It shows higher AKI incidence in females (17.2% vs. 12.1%, P = 0.026) with distinct sex-specific risks: Higher HbA1c was paradoxically protective in both sexes (female OR = 0.73; male OR = 0.81), hyperkalemia impact (OR = 5.88 vs. 4.02), and HDL protection (OR = 0.16); males exhibited hyperphosphatemia hazard(OR = 14.32). STEMI unexpectedly reduced AKI risk in both sexes (female OR = 0.36; male OR = 0.64). Univariate regression analysis shows the association between electrolyte imbalances, particularly hyperphosphatemia, and AKI risk was significantly stronger in males (OR = 14.3) than in females (OR = 5.2). Conversely, abnormalities in lipid metabolism demonstrated a significant protective effect against AKI exclusively in females. Additionally, advanced age, higher Killip class, hypoalbuminemia, and elevated fibrinogen were significant predictors of AKI development in both sexes. Conclusions: This study reveals significant sex disparities in AKI risk among T2DM-AMI patients: females show higher incidence, while hyperphosphatemia strongly predicts risk in males and hyperkalemia/Killip class in females. Elevated HbA1c paradoxically reduced risk in both. We recommend sex-specific management: monitor phosphorus in males and potassium with hemodynamics in females. Future work should develop sex-stratified risk models and clarify mechanisms.

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11. **The Impact of Nurse Staffing and Education on 30-Day Mortality Among Patients Hospitalized for Acute Kidney Injury.**

Authors: Iroegbu C.;KutneyLee A.;Chittams J.;Leak S. and BrooksCarthon, M.

Publication Date: 2025

Journal: Research in Nursing & Health (pagination), pp. Date of Publication: 29 Se 2025

Abstract: Acute kidney injury (AKI) affects approximately 20% of hospitalized patients and is associated with higher mortality, extended hospital stay, and increased costs. While various strategies have been proposed to improve AKI management, the impact of nursing resources on AKI outcomes has not been explored. We sought to examine the association between nursing resources and 30-day mortality among patients hospitalized with AKI. Using a cross-sectional study design, we linked data from the CMS Medicare Provider Analysis and Review file, American Hospital Association Annual Survey, and RN4CAST-NY/IL survey of registered nurses. We identified 24,368 Medicare beneficiaries aged 18-99 years with a primary diagnosis of AKI hospitalized in 155 hospitals in New York and Illinois in 2021. The primary outcome was 30-day mortality. Key independent variables included nurse staffing (patient-to-nurse ratio) and nurse education (proportion of nurses holding a bachelor's degree or higher). Covariates were patient demographics, comorbidities, and hospital characteristics. The 30-day mortality rate was 10.5%. In adjusted logistic regression models, each additional patient per RN increased the odds of 30-day mortality by 7% (OR = 1.07, 95% CI [1.01-1.13], p

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12. **Post-operative infection treatment in cardiac surgery: current practices and future directions**

Authors: Jain, Rishab;Yadav, Shikha;Bukke, Sarad Pawar Naik;Chettupalli, Ananda Kumar and Thalluri, Chandrashekar

Publication Date: Oct 15 ,2025

Journal: Perioperative Medicine 14(1), pp. 110

Abstract: Surgical site infections (SSIs) are a major complication in surgical patients, particularly after cardiac surgeries, where the risk of postoperative infection ranges from 3.5% to 26.8%. Mediastinitis, severe concerns associated with open cardiac surgery, is linked to extreme deaths, increased medical expenses during hospitalization. We investigated the incidence and features of mediastinitis over a twenty-nine-year period as patient demographics and surgical indications evolved. Escherichia coli bloodstream infections (BSIs) contribute to significant mortality (5%-30%), with factors contributing to death remaining unclear, particularly with the rise of ESBL-producing organisms. Infective endocarditis (IE) is an infection that affects the cardiac endocardial layer, may cause valve vegetation, abscesses, and myopericarditis. Postoperative management requires a clinician with a deep understanding of cardiopulmonary function to address complications promptly. Infections of cardiac implanted electronic devices (CIEDs) are catastrophic, causing significant morbidity and mortality. Among CIED complications, infections drastically affect survival rates, require re-intervention, and lengthen hospital stays. Research shows a 1% infection rate within 12 months after CIED surgery. Acute Kidney Injury (AKI) is a common complication following major cardiac surgery, particularly in procedures involving cardiopulmonary bypass (on-pump). AKI significantly increases the risk of chronic kidney disease, cardiovascular complications, and mortality. Advanced age and pre-existing chronic kidney disease are recognized as key risk factors. Sepsis-induced cardiomyopathy (SICM), though primarily a general complication of severe sepsis, can also occur in post-cardiac surgery patients who develop sepsis as a secondary complication. The absence of standardized diagnostic criteria highlights an important knowledge gap and underscores the need for further research to improve recognition and management in this high-risk group.

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13. **A qualitative study of nephrologists' perspectives on implementing a nephrology rapid response model for acute kidney injury.**

Authors: Jawabreh B.;Khatib S. and Hamdan, M.

Publication Date: 2025

Journal: BMC Nephrology 26(1) (pagination), pp. Article Number: 534. Date of Publication: 01 Dec 2025

Abstract: Introduction: Acute kidney injury (AKI) poses major health and economic burdens, especially in low-resource settings like Palestine. This study explores nephrologists' perspectives on implementing the Nephrology Rapid Response Team (NRRT) model, highlighting key barriers, facilitators, and strategic priorities to improve AKI care. Study Design: A qualitative, exploratory study design was employed to gain in-depth nephrologists' perspectives on the feasibility of implementing the Nephrology Rapid Response Team (NRRT) model in Palestinian hospitals. Method(s): Thirteen board-certified nephrologists were recruited using purposive sampling. Semi-structured interviews were conducted between January and May 2024, with data transcribed verbatim and analyzed thematically using MAXQDA Analytics Pro software. Thematic analysis identified key facilitators, barriers, and recommendations. Rigorous methodological strategies ensured the credibility, dependability, and transferability of the findings. Result(s): Five enablers themes emerged that could facilitate integration of the model: strategic backing from the Ministry of Health, a growing orientation toward prevention-driven healthcare policies, enhanced multidisciplinary collaboration with early nephrologist engagement, institutional endorsement through hospital-based systems, and the progressive adoption of technological innovations such as electronic alert systems and novel biomarkers. On the other hand, five dominant barrier themes emerged. These include systemic governance and policy fragmentation, financial and operational limitations, a pronounced shortage of nephrology specialists, insufficient awareness and prevention frameworks, and weak collaboration and surveillance systems-particularly the lack of a national renal registry. Despite these obstacles, nephrologists expressed optimism, offering three central recommendations to support sustainable implementation. These include systemic policy and governance reforms, investments in nephrology education and training programs, and the expansion of public awareness and prevention strategies through primary care engagement. Together, these strategies represent a foundational roadmap for overcoming structural challenges and AKI care delivery through the NRRT model. Conclusion(s): This study highlights the Ministry of Health's critical role in leading reforms for NRRT implementation, emphasizing prevention, technology, and capacity-building as priorities to improve nephrology care. Clinical trial number: Not applicable.Copyright © The Author(s) 2025.

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14. **Spinal cord injury is an independent risk factor for acute kidney injury in traumatic spine-injured patients in the National Trauma Data Bank.**

Authors: Kanter J.H.;Raja V.;Bonney P.A.;Gumbel J.H.;Tarapore P.E.;Huang M.C.;Manley G.T. and DiGiorgio, A. M.

Publication Date: 2025

Journal: Journal of Spinal Cord Medicine (pagination), pp. Date of Publication: 2025

Abstract: Introduction: Patients with spine injuries are at risk of acute kidney injury (AKI) through several mechanisms. Objective(s): This study aims to assess the rate of severe AKI in a nationally representative sample of patients with spine injuries and determine whether SCI is an independent risk factor. Method(s): We conducted a cohort study utilizing the National Trauma Databank (NTDB) Patients included were 18 years or older with cervical or thoracic spine injuries (spine fractures and/or spinal cord injury) based on International Classification of Disease (ICD) codes from 2017 to 2022. Patients with pre-existing renal impairment were excluded. Logistic regression was used to determine the association between demographic and injury variables with incident AKI. Result(s): 313,838 spinal injury patients were analyzed, of which 3,288 (1.05%) developed AKI. Patients with AKI were older (61 +/- 19 vs. 55 +/- 21 years, P Result(s): 313,838 spinal injury patients were analyzed, of which 3,288 (1.05%) developed AKI. Patients with AKI were older (61 +/- 19 vs. 55 +/- 21 years, P Result(s): 313,838 spinal injury patients were analyzed, of which 3,288 (1.05%) developed AKI. Patients with AKI were older (61 +/- 19 vs. 55 +/- 21 years, P Result(s): 313,838 spinal injury patients were analyzed, of which 3,288 (1.05%) developed AKI. Patients with AKI were older (61 +/- 19 vs. 55 +/- 21 years, P

Result(s): 313,838 spinal injury patients were analyzed, of which 3,288 (1.05%) developed AKI. Patients with AKI were older (61 +/- 19 vs. 55 +/- 21 years, P Conclusion(s): AKI is associated with morbidity and mortality in patients with spine injuries. Comorbidities and more severe injuries, including the presence of SCI, are associated with AKI. More work is warranted to understand mechanisms of AKI in these patients.

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15. **Admission blood gas variables and electrolytes in predicting significant endpoints in ICU patients with emerging acute kidney injury.**

Authors: Khader B.;Lehmann R.;Marahrens B.;Ritter O. and Patschan, D.

Publication Date: 2025

Journal: Kidney & Blood Pressure Research , pp. 1–17

Abstract: Introduction Acute kidney injury (AKI) is a prevalent issue in intensive care units (ICUs). There is a paucity of data regarding the use of blood gas and electrolyte measurements in predicting the risk of significant endpoints (kidney replacement therapy, death) in emerging, yet undiagnosed AKI. Methods Retrospective, observational, single-center study. The study documented 4 admission electrolytes (serum sodium, potassium, ionized calcium, and phosphate) and 3 admission blood gas variables (arterial pH, actual bicarbonate, pCO2). The endpoints of the study were the need for kidney replacement therapy (KRT) and death in the ICU. Results A total of 213 patients were included in the study. The ICU mortality rate was 31%, and 22.5% of all subjects required at least one individual KRT session. There were significant differences in admission serum sodium and phosphate levels between survivors and non-survivors (both lower in survivors), and in arterial pH and actual bicarbonate levels (both higher in survivors). The majority of all tested variables were identified as independent predictors of either the need for KRT or ICU death. Conclusions Integrating admission electrolytes and blood gas variables may potentially aid in identifying subsets of acute kidney injury (AKI) patients at risk of death.

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16. **Outcomes of Hospitalized Liver Cirrhosis Patients With COVID-19 Infection: A Retrospective Analysis.**

Authors: Lee, Ki Jung;Patel, Parth and Karagozian, Raffi

Publication Date: Sep ,2025

Journal: Cureus 17(9), pp. e91524

Abstract: Background Patients with liver cirrhosis (LC) are at an increased risk of adverse outcomes associated with coronavirus disease 2019 (COVID-19). Existing studies have demonstrated a higher prevalence of malnutrition among COVID-19 patients. However, there is limited research assessing the impact of malnutrition on COVID-19 patients hospitalized with cirrhosis. Methodology We conducted a retrospective analysis of patients with LC admitted to hospitals in the United States in 2020 using the National Inpatient Sample (NIS) database. We compared in-hospital mortality, the risk for acute kidney injury (AKI), and length of stay (LOS) between malnourished and non-malnourished LC patients with COVID-19. Multivariable logistic regression analysis assessed the independent association between malnutrition in these patients and the outcomes of interest. Results Among 5,192 LC patients with COVID-19 and LC identified in the NIS database, 4,593 (88.5%) were not malnourished, and 599 (11.5%) were malnourished. The median age of non-malnourished patients was 63 (interquartile range (IQR) = 54-72) years, and that of malnourished patients was 64 (IQR = 56-72) years. Examining the baseline characteristics, the following did not have statistically significant differences: sex (male: non-malnourished: 60.4% vs. malnourished: 61.6%) and race (White: 50.5% vs. 49.9%). Malnourished patients with LC and COVID-19 were more likely to have hyponatremia (217; 36.2% vs. 1,200; 26.1%) and chronic kidney disease (CKD) (146; 24.4% vs. 928; 20.2%) but less likely to have hypertension (149; 24.9% vs. 1484; 32.3%), hyperlipidemia (141; 23.5% vs. 1441; 31.3%), obesity (75; 12.5% vs. 1010; 22.0%), and diabetes (53; 8.8% vs. 718; 15.6%). Malnourished patients had a significantly higher

in-hospital mortality rate (171; 28.5%) compared to non-malnourished patients (836; 18.2%) (p

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17. **Leveraging artificial intelligence for early detection and prediction of acute kidney injury in clinical practice.**

Authors: Liang B.;Ma C. and Lei, M.

Publication Date: 2025

Journal: Frontiers in Physiology 16(pagination), pp. Article Number: 1612900. Date of Publication: 2025

Abstract: Introduction: Acute kidney injury (AKI) is a severe and rapidly developing condition characterized by a sudden deterioration in renal function, impairing the kidneys' ability to excrete metabolic waste and regulate fluid balance. Timely detection of AKI poses a significant challenge, largely due to the reliance on retrospective biomarkers such as elevated serum creatinine, which often manifest after substantial physiological damage has occurred. The deployment of AI technologies in healthcare has advanced early diagnostic capabilities for AKI, supported by the predictive power of modern machine learning frameworks. Nevertheless, many traditional approaches struggle to effectively model the temporal dynamics and evolving nature of kidney impairment, limiting their capacity to deliver accurate early predictions. Method(s): To overcome these challenges, we propose an innovative framework that fuses static clinical variables with temporally evolving patient information through a Long Short-Term Memory (LSTM)-based deep learning architecture. This model is specifically designed to learn the progression patterns of kidney injury from sequential clinical data-such as serum creatinine trajectories, urine output, and blood pressure readings. To further enhance the model's temporal sensitivity, we incorporate an attention mechanism into the LSTM structure, allowing the network to prioritize critical time segments that carry higher predictive value for AKI onset. Result(s): Empirical evaluations confirm that our approach surpasses conventional prediction methods, offering improved accuracy and earlier detection. Discussion(s): This makes it a valuable tool for enabling proactive clinical interventions. The proposed model contributes to the expanding landscape of AI-enabled healthcare solutions for AKI, supporting the broader initiative to incorporate intelligent systems into clinical workflows to improve patient care and outcomes.

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18. **Integrating Pre- and Postoperative Systemic Inflammatory Markers for Acute Kidney Injury Prediction Following Radical Cystectomy: A Multi-Center Retrospective Study.**

Authors: Liu, Zhongqi;Fan, Peng;Lu, Yanan;Cao, Minghui;Yao, Weifeng;Chen, Dongtai and Ji, Fengtao

Publication Date: 2025

Journal: Journal of Inflammation Research 18, pp. 13335–13345

Abstract: Purpose: The present study aimed to investigate the association of perioperative dynamic changes of systemic inflammation markers with AKI after radical cystectomy and their predictive value through machine learning algorithms. Patients and Methods: Patients undergoing radical cystectomy with urinary diversion for bladder cancer from 2013 to 2022 at three university-affiliated tertiary hospitals were gathered. Perioperative dynamic changes of systemic inflammatory markers were calculated based on peripheral blood cell counts from pre- and post-operative values and categorized using restricted cubic splines (RCS). The number of positive changes in these markers was recorded as the perioperative inflammation index. Multivariable logistic regression was utilized to identify risk factors for AKI after radical cystectomy. AKI prediction models were constructed through various supervised machine learning algorithms and evaluated by the area under the receiver operating characteristic curve (AUROC). Results: 727 patients were finally enrolled in the study, with 151 (20.8%) patients experiencing AKI following radical cystectomy. Postoperative hemoglobin (p = 0.003; OR,

0.977; 95% CI, 0.962-0.992), albumin level (p = 0.007; OR, 0.906; 95% CI, 0.843-0.974), intraoperative fluid infusion rate (p : 727 patients were finally enrolled in the study, with 151 (20.8%) patients experiencing AKI following radical cystectomy. Postoperative hemoglobin (p = 0.003; OR, 0.977; 95% CI, 0.962-0.992), albumin level (p = 0.007; OR, 0.906; 95% CI, 0.843-0.974), intraoperative fluid infusion rate (p : 727 patients were finally enrolled in the study, with 151 (20.8%) patients experiencing AKI following radical cystectomy. Postoperative hemoglobin (p = 0.003; OR, 0.977; 95% CI, 0.962-0.992), albumin level (p = 0.007; OR, 0.906; 95% CI, 0.843-0.974), intraoperative fluid infusion rate (p Conclusion: The association between perioperative dynamic changes of inflammatory markers and AKI after radical cystectomy reinforced the necessity of perioperative inflammatory evaluation. AKI predictive models, integrating perioperative metrics, enable early identification and optimize perioperative management for AKI prevention. Copyright © 2025 Liu et al.

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19. **Perioperative acute kidney injury: current prevention, detection, and management strategies.**

Authors: Mangano N.;Nguyen N.;Davis M.;Key B.;Feit A. and Bergese, S. D.

Publication Date: 2025

Journal: Journal of Anesthesia (pagination), pp. Date of Publication: 2025

Abstract: Acute kidney injury (AKI) is a common and serious perioperative complication with several diverse etiologies. Elderly surgical patients are particularly vulnerable, experiencing higher rates of AKI and suffering worse outcomes, including multiorgan dysfunction, elevated mortality rates, and a heightened risk of developing chronic kidney disease (CKD) or end-stage renal disease (ESRD). AKI also imposes a significant economic burden, increasing healthcare costs due to prolonged hospitalizations and increased resource utilization. Given the limited treatment options for AKI, prevention is paramount. This involves identifying and optimizing modifiable patient, surgical, and anesthetic risk factors, implementing evidence-based care bundles in high-risk patients, avoiding potential causes of kidney insult, and employing novel preventive strategies such as remote-ischemic preconditioning. Early diagnosis is crucial when prevention fails, allowing timely intervention before irreversible kidney damage occurs. Novel diagnostic tools show promise in improving the accuracy and timeliness of AKI detection, facilitating prompt management. While renal-replacement therapy (RRT) remains the only definitive treatment for AKI, more refined criteria for its initiation are needed to enhance its delivery and improve patient outcomes.Copyright © The Author(s), under exclusive licence to Japanese Society of Anesthesiologists 2025.

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20. **Critical care nephrology: opportunities for implementing green practices**

Authors: Molano-Trivino, Alejandra;Rizo-Topete, Lilia Maria;Zuniga, Eduardo;Castellanos-De la Hoz, Juan Camilo and Karopadi, Akash Nayak

Publication Date: 2025

Journal: Frontiers in Medicine 12, pp. 1635718

Abstract: The intersection between climate change, healthcare, and nephrology is becoming increasingly evident. Globally, healthcare systems contribute approximately 4.4% of greenhouse gas emissions, with intensive care units (ICUs) representing some of the most resource-intensive hospital areas. Within this environment, critical care nephrology plays a central role, particularly in managing acute kidney injury (AKI) and delivering renal replacement therapies (RRT) such as hemodialysis, continuous renal replacement therapy (CRRT), and peritoneal dialysis. Nephrology interventions in the ICU, while life-saving, are associated with high environmental costs, including significant water consumption, energy use, and the production of large volumes of medical waste For instance, a single hemodialysis session can consume over 500 liters of water, while CRRT in critically ill patients may require 10 to 15 large plastic bags daily, most of which are incinerated as hazardous waste Nephrology has pioneered "Green Nephrology" initiatives focused on reducing the ecological footprint of chronic

dialysis through water reuse, optimized dialysis fluid flows, and material recycling (8, 11), however, similar structured strategies for sustainability within critical care nephrology remain underdeveloped. This article explores the environmental challenges of nephrology practice in ICUs, highlights existing gaps, and proposes opportunities, including artificial intelligence (AI) to promote sustainable, high-quality kidney care for critically ill patients. Copyright © 2025 Molano-Trivino, Rizo-Topete, Zuniga, Castellanos-De la Hoz and Karopadi.

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21. **Frequency of acute kidney injury in post-liver transplantation and associated factors: a systematic review.**

Authors: Moura A.F.;Costa A.L.;Evangelista M.T.C.;Guimaraes A.C.L.;Freitas A.G.;Vinhaes G.P.C.;Fernandes M.E.S.M.P.;MouraLandim D.Q.;MouraNeto J.A. and Cruz, C. M. S.

Publication Date: 2025

Journal: Jornal Brasileiro De Nefrologia 47(4), pp. e20250022

Abstract: INTRODUCTION: Acute kidney injury (AKI) is a common complication following liver transplantation (LT). It is associated with factors such as perioperative hemodynamic instability, prolonged surgery, and use of nephrotoxic immunosuppressants, contributing to increased mortality, graft failure, and extended hospital stay. METHOD(S): A systematic search of the databases PubMed, Embase, and the Cochrane Central Register of Controlled Trials was conducted to identify observational studies with samples of at least 50 patients aged 18 years or older who underwent LT and analyzed AKI incidence post-procedure and assess long-term renal outcomes. RESULT(S): A total of 30 studies with a total of 13,653 patients were included. The incidence of AKI post-LT was 46% (95% CI: 45%-47%), with significant variation across studies (24% to 84%) and high heterogeneity (I2 = 97%, p RESULT(S): A total of 30 studies with a total of 13,653 patients were included. The incidence of AKI post-LT was 46% (95% CI: 45%-47%), with significant variation across studies (24% to 84%) and high heterogeneity (I2 = 97%, p RESULT(S): A total of 30 studies with a total of 13,653 patients were included. The incidence of AKI post-LT was 46% (95% CI: 45%-47%), with significant variation across studies (24% to 84%) and high heterogeneity (I2 = 97%, p CONCLUSION(S): AKI and dialysis requirements are frequent complications following LT. Multiple risk factors, including HTN, diabetes, and prolonged hospitalization, are associated with an increased risk of AKI post-LT. The high incidence of AKI underscores the importance of early identification of at-risk patients and multidisciplinary approaches to improve outcomes.

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22. **Energy drink-induced acute kidney injury: a case report and review of the literature.**

Authors: Murt, A.

Publication Date: 2025

Journal: Journal of Medical Case Reports 19(1) (pagination), pp. Article Number: 522. Date of Publication: 01 Dec 2025

Abstract: Background: Nephrotoxic insults are among the most common causes of acute kidney injuries. The offending drug or agent should be defined swiftly and must be stopped. In some situations, the culprit agent may not be obvious. Energy drink consumption has reportedly increased in recent years, with ads claiming that energy drinks strengthen physical and mental performance. However, when consumed in uncontrolled amounts, they may have negative effects on health. An energy drink-induced acute kidney injury is reported in this case presentation. There have been only four similar cases in the literature. Case presentation: A 21-year-old male patient of Turkish origin applied to the emergency department with nausea, vomiting, and malaise. He was admitted, because the laboratory values revealed that he had stage 3 acute kidney injury. He did not have any medical or surgical histories. He did not use any drugs, but he stated that he has consumed 2 L of an energy drink product per day for the past month. Differential diagnosis work-up pointed to an energy drink-induced acute kidney injury. His serum creatinine increased to a level as high as 10.32 mg/dL, but he did not

need any renal replacement therapy. Creatinine levels normalized in about 2 weeks after withholding energy drinks. Conclusion(s): Depending on their content and consumption amount, energy drinks may cause acute kidney injury. There have been four previous cases in the literature and they were reviewed for a comparison with this case.

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23. **Prevention and Management of Perioperative Acute Kidney Injury: A Narrative Review.**

Authors: O'Dell Duplechin M.;Folds G.T.;Duplechin D.P.;Ahmadzadeh S.;Myers S.H.;Shekoohi S. and Kaye, A. D.

Publication Date: 2025

Journal: Diseases 13(9) (pagination), pp. Article Number: 295. Date of Publication: 01 Se 2025

Abstract: Acute kidney injury is a common complication in the perioperative setting, especially among patients undergoing high-risk surgeries such as cardiac, abdominal, or orthopedic procedures. Characterized by a sudden decline in renal function, perioperative acute kidney injury is typically diagnosed based on rising serum creatinine or reduced urine output. Its incidence varies depending on the surgical type and patient risk factors, but even mild cases are linked to significant consequences, including prolonged hospital stays, enhanced healthcare costs, and higher mortality rates. Despite advances in surgical and anesthetic care, acute kidney injury remains a major cause of morbidity. The development of acute kidney injury in the perioperative period often results from a complex interplay of hypoperfusion, ischemia-reperfusion injury, inflammation, and exposure to nephrotoxic agents. While some predictive models and biomarkers, such as neutrophil gelatinase-associated lipocalin (NGAL), have shown promise in identifying patients at risk, widespread adoption remains inconsistent, and standardized prevention protocols are lacking. This narrative review synthesizes current evidence on the pathophysiology, risk factors, and prevention strategies for perioperative acute kidney injury. It explores emerging tools for risk stratification and early diagnosis, including novel biomarkers and learning-based models. Additionally, it highlights pharmacologic and non-pharmacologic measures to reduce acute kidney injury incidence, such as balanced fluid management, renal-protective anesthetic strategies, and bundle-based care approaches. Emphasizing a multidisciplinary and personalized model of care, this review highlights the need for coordinated efforts between anesthesiologists, surgeons, and nephrologists to identify modifiable risks and improve outcomes. Reducing the incidence of perioperative acute kidney injury has the potential to enhance recovery, preserve long-term kidney function, and ultimately improve surgical safety.

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24. **Severe acute kidney injury in the intensive care unit: step-to-step management.**

Authors: Riccardi M.;Pagnesi M.;Lombardi C.M. and Metra, M.

Publication Date: 2025

Journal: European Heart Journal: Acute Cardiovascular Care 14(10), pp. 618–630

Abstract: Acute kidney injury (AKI) is a sudden loss of renal function limited to 7 days with increased basal serum creatinine levels and/or decreased urinary production. AKI is a frequent condition in the intensive care unit (ICU) ranging from 13% to 36% in patients hospitalized with acute heart failure, up to 80% in patients with cardiogenic shock (CS). AKI requiring dialysis is also common (5% to 8%) and can exceed 13% in patients with CS. AKI is consistently associated with increased mortality in both the short-term, especially when dialysis is needed, and the long-term. The aim of this review is to provide an update on step-by-step management, from pharmacological treatment to renal replacement therapy, in patients with severe AKI in ICU patients with fluid overload.

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25. **Prevalence and prognostic significance of malnutrition in critically ill patients with acute kidney injury.**

Authors: Shi Y.;Duan H.;Liu J.;Shi X.;Zhao M.;Fang Y. and Zhang, Y.

Publication Date: 2025

Journal: Journal of Renal Nutrition : The Official Journal of the Council on Renal Nutrition of the National Kidney Foundation (pagination), pp. Date of Publication: 01 Oct 2025

Abstract: BACKGROUND: Malnutrition is a significant factor associated with adverse outcomes in various diseases. However, the prevalence of malnutrition among critically ill patients with acute kidney injury (AKI) and its impact on outcomes have not been thoroughly investigated. The purpose of this study was to investigate the prevalence and prognostic significance of malnutrition in critically ill patients with AKI. METHOD(S): Critically ill patients with AKI were selected from the Medical Information Mart for Intensive Care IV through a retrospective cohort study. The nutritional status of these patients was assessed using Prognostic Nutrition Index (PNI), Geriatric Nutritional Risk Index (GNRI), and Controlled Nutritional Status (CONUT). Cox proportional hazard model, Kaplan-Meier analysis and limited cubic spline were used to evaluate the association between malnutrition risk and 28-day mortality. Additionally, logistic regression, Cox regression and linear regression utilized to assess the correlation between malnutrition risk and in-hospital mortality, 90-day mortality and hospital length of stay, respectively. RESULT(S): Of the 1129 patients enrolled, 49.6%, 80.0%, and 57.7% were found to have moderate to severe malnutrition based on PNI, GNRI, and CONUT scores, respectively. Higher risk of malnutrition was associated with lower hemoglobin, lymphocytes, serum albumin, total cholesterol, higher creatinine,BUN, SOFA, SAPS II, higher mortality, and longer hospital stay. Among the patients, 215 (19.04%) patients died within 28 days of ICU admission. Malnutrition was significantly associated with 28-day mortality risk compared with good nutrition (adjusted hazard ratio for severe malnutrition: PNI:HR 1.57, 95% CI 1.15-2.14; GNRI:HR 1.62, 95% CI 1.01-2.55; CONUT:HR 2.51, 95% CI 1.31-4.80). These nutritional measures further enhanced the predictive accuracy of 28-day mortality, with the CONUT score demonstrating the strongest association. Furthermore, logistic regression, Cox regression, and linear regression models respectively revealed that malnutrition risk was significantly associated with in-hospital mortality, 90-day mortality, and hospital length of stay. CONCLUSION(S): Malnutrition is prevalent among critically ill patients with AKI and significantly correlates with 28-day mortality, in-hospital mortality, 90-day mortality and hospital length of stay. Further research is necessary to evaluate the impact of malnutrition screening and nutritional interventions on improving adverse outcomes.

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26. **Risk factors, outcomes, and early prediction of cardiac surgery-associated acute kidney injury: a post hoc subgroup analysis of the Epidemiology of Surgery Associated Acute Kidney Injury study.**

Authors: Strauss C.;Albert F.;Bormann E.;Engelman D.T.;Bellomo R. and Zarbock, A.

Publication Date: 2025

Journal: British Journal of Anaesthesia (pagination), pp. Date of Publication: 2025

Abstract: Background: Cardiac surgery-associated acute kidney injury (CSA-AKI) is a common and important complication. The risk factors for CSA-AKI remain poorly described. We aimed to identify risk factors for CSA-AKI and develop a risk score for persistent CSA-AKI. Method(s): We performed a post hoc subgroup analysis restricted to patients who underwent cardiac surgery within the Epidemiology of Surgery Associated Acute Kidney Injury (EPIS-AKI) study. CSA-AKI was defined as AKI (according to the Kidney Disease: Improving Global Outcomes criteria) within 72 h after surgery. Persistent CSA-AKI was defined as CSA-AKI lasting >48 h. We performed multivariable logistic regression analyses to identify risk factors for CSA-AKI and related outcomes. Result(s): The original EPIS-AKI study included 3101 cardiac surgery patients. Of these, 802 (25.9%) developed CSA-AKI. On follow-up, 279 of the 802 patients (34.8%) developed persistent CSA-AKI. We identified independent risk factors for CSA-AKI, moderate/severe CSA-AKI, and persistent CSA-AKI. Patients with persistent CSA-AKI had a higher ICU and hospital mortality compared with patients with transient CSA-AKI. We developed a risk

score for predicting persistent CSA-AKI with an area under the receiver operating characteristic curve of 0.79 (95% confidence interval, 0.7355-0.8457). Conclusion(s): Overall, 25% of cardiac surgery patients developed CSA-AKI, and 33% of these patients experienced persistent CSA-AKI, which was associated with poor outcomes. We developed a risk score for predicting persistent CSA-AKI, the 'EPIS CSA-AKI risk score'. Pending further external validation, the score might be used to identify patients who have a high risk for developing persistent CSA-AKI.Copyright © 2025 The Author(s)

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27. **Causal deep learning for real-time detection of cardiac surgery-associated acute kidney injury: derivation and validation in seven time-series cohorts.**

Authors: Zhong Q.;Cheng Y.;Li Z.;Wang D.;Rao C.;Jiang Y.;Li L.;Wang Z.;Liu P.;Che H.;Li P.;Lu X.;Suo J. and He, K.

Publication Date: 2025

Journal: The Lancet.Digital Health , pp. 100901

Abstract: BACKGROUND: Cardiac surgery-associated acute kidney injury (CSA-AKI) is a complex complication substantially contributing to an increased risk of mortality. Effective CSA-AKI management relies on timely diagnosis and interventions. However, many cases are detected too late. Despite the advancements in novel biomarkers and data-driven predictive models, existing practices are primarily constrained due to the limited discriminative and generalisation capabilities and stringent application requirements, presenting major challenges to the timely and effective diagnosis and interventions in CSA-AKI management. This study aimed to develop a causal deep learning architecture, named REACT, to achieve precise and dynamic predictions of CSA-AKI within the subsequent 48 h. METHOD(S): In this retrospective model development and prospective validation study, we included adult patients (aged >=18 years) from seven distinct cohorts undergoing major open-heart surgery for model training and validation. Data for model development and internal validation were sourced from electronic health records of two large centres in Beijing, China, between Jan 1, 2000, and Dec 31, 2022. External validation was conducted on three independent centres in China between Jan 1, 2000, and Dec 31, 2022, along with cross-national data from the public databases MIMIC-IV and eICU in the USA. To facilitate implementation, we also developed a publicly accessible web calculator and applet. The model's prospective application was validated from June 1, to Oct 31, 2023, at two centres in Beijing and Nanjing, China. FINDINGS: The final derivation cohort included 14 513 eligible patients with a median age of 56 years (IQR 45-65), 5515 (38.0%) patients were female, and 3047 (21.0%) developed CSA-AKI. The external validation dataset included 20 813 patients from China and 28 023 from the USA. REACT reduced 1328 input variables to six essential causal factors for CSA-AKI prediction. In internal validation, REACT achieved an average area under the receiver operating characteristic curve (AUROC) of 0.930 (SD 0.032), outperforming state-of-the-art deep learning architectures, specifically transformer-based and long short-term memory-based models, which rely on more complex variables. The model consistently outperformed in external validation across different centres (average AUROC 0.920 [SD 0.036]) and regions (0.867 [0.073]), as well as in prospective validation (0.896 [0.023]). Compared with guideline-recommended pathways, REACT detected CSA-AKI on average 16.35 h (SD 2.01) earlier in external validation. INTERPRETATION: We proposed a causal deep learning approach to predict CSA-AKI risk within 48 h, distilling the complex temporal interactions between variables into only a few universal, relatively cost-effective inputs. The approach shows great potential for deployment across hospitals with minimum data requirements and provides a general framework for causal deep learning and early detection of other conditions. FUNDING: The Construction Project and the National Natural Science Foundation of China.

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28. **Association between red cell distribution width-to-albumin ratio and acute kidney injury in acute pancreatitis: A retrospective cohort study from the MIMIC-IV database.**

Authors: Zhou C.J.;Lin S.M. and Zheng, J. T.

Publication Date: 2025

Journal: Medicine 104(40), pp. e44810

Abstract: This study aimed to evaluate the association between the red cell distribution width-to-albumin ratio (RAR) and the early onset of Acute Kidney Injury (AKI) in patients diagnosed with acute pancreatitis (AP). A retrospective cohort study was conducted using data from the Medical Information Mart for Intensive Care IV database, focusing on the first 24 hours following admission to the intensive care unit (ICU). The primary outcome was the incidence of AKI within 7 days of ICU admission, as defined by the Kidney Disease: Improving Global Outcomes criteria. Logistic regression models were employed to assess the association, with subgroup analyses considering variables such as age, sex, renal disease, diabetes, sepsis, use of mechanical ventilation, and sequential organ failure assessment scores. The analysis included 599 patients. Each unit increase in RAR was linearly associated with a 62% greater likelihood of AKI within 7 days of ICU admission (odds ratio = 1.62, 95% confidence interval [CI]: 1.34-1.96, P

Sources Used:

The following databases are used in the creation of this bulletin: EMBASE and Medline.

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