

AKI

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1. Impact of an Artificial Intelligence-Powered Clinical Decision Support System for Acute Kidney Injury Prevention in the Intensive Care Unit: Single-Center Uncontrolled Before-and-After Implementation Study.

Authors: Alfieri, Francesca; Ancona, Andrea; Bacci, Alessandro; Zappala, Simone and Perez, Jordi Morillas

Publication Date: Jul 08 ,2026

Journal: JMIR Formative Research 10, pp. e87738

Abstract: Background: Acute kidney injury (AKI) is a frequent and serious complication among hospitalized patients, particularly in critical care settings, where its incidence can exceed 50%. AKI is associated with increased mortality, prolonged hospitalization, dialysis dependence, and higher health care costs. Although the KDIGO (Kidney Disease: Improving Global Outcomes) guidelines emphasize supportive care, hemodynamic optimization, and avoidance of nephrotoxins, their implementation remains inconsistent, partly due to the lack of timely risk stratification. Recent advances in artificial intelligence have enhanced early prediction and detection of AKI, offering new opportunities to improve patient outcomes and intensive care unit (ICU) efficiency. The U-Care Renal Platform (UCRP; U-Care Medical S.r.l), a Conformite Europeenne (CE)-marked artificial intelligence-powered medical device, integrates directly with the ICU electronic health record to continuously analyze patient data and predict the risk of moderate or severe AKI within 24 hours, providing actionable, guideline-based

recommendations. While the predictive performance of UCRP has been validated previously, its real-world impact on clinical and operational outcomes in the ICU remains underexplored. Objective: This single-center uncontrolled before-and-after implementation study aims to evaluate the association between UCRP implementation and selected ICU clinical and operational outcomes in routine practice at SCIAS Hospital, Barcelona. Methods: This study was conducted as a retrospective service evaluation of a workflow-embedded clinical decision support system between March 2023 and March 2025. It included 202 postsurgical adult ICU patients. Outcomes of interest were assessed by comparing preimplementation and postimplementation periods. Months during which the UCRP was inactive were excluded from the analysis (total excluded duration: 10 months; 5 in the preimplementation period and 5 in the postimplementation period). The outcomes included the incidence of moderate-to-severe AKI (KDIGO stages 2 and 3), the use of nephrotoxic medications, the frequency of hypotensive episodes among patients with AKI, and the ICU length of stay. Results: During the postimplementation period, lower rates of moderate-to-severe AKI (9/99, 9.1% vs 12/103, 11.7%), nephrotoxic drug administration, and hypotensive episodes among patients with AKI were observed compared with the preimplementation period. Conclusions: Integration of the UCRP into ICU workflows was associated with differences in selected AKI-related process and intermediate clinical outcomes in this single-center uncontrolled before-and-after implementation study. However, given the study design, causal relationships cannot be established, and the findings should be interpreted as preliminary signals requiring confirmation in larger, controlled, and multicenter studies, including patient-centered outcomes. Copyright © Francesca Alfieri, Andrea Ancona, Alessandro Bacci, Simone Zappala, Jordi Morillas Perez. Originally published in JMIR Formative Research (<https://formative.jmir.org>).

2. Preoperative Anaemia, Renal Function, and Operative Factors in Acute Kidney Injury and Mortality After Cardiac Surgery with a Prolonged ICU Stay: A Retrospective Cohort Study.

Authors: Balkan B.;Turan E.I.;Unal O. and Yalcin, L.

Publication Date: 2026

Journal: Journal of Clinical Medicine 15(12) (pagination), pp. Article Number: 4498. Date of Publication: 01 Jun 2026

Abstract: Background: Acute kidney injury (AKI) is one of the more serious complications following cardiac surgery, consistently linked to prolonged mechanical ventilation and higher in-hospital mortality. This study examined whether preoperative anaemia and impaired renal function are associated with AKI and death in a high-risk cardiac-surgery cohort requiring extended postoperative ICU monitoring and how these associations behave after adjustment for procedure type and intraoperative variables. Method(s): In this single-centre retrospective cohort study, we screened 950 patients admitted to a cardiothoracic ICU between January 2018 and January 2024. After standard exclusion criteria and an audit of operative records, 553 cardiac-surgery patients formed the principal analysis cohort. AKI was defined by KDIGO criteria using serial postoperative serum-creatinine measurements during the first 7 days. Multivariable logistic regression for AKI and in-hospital mortality was built sequentially: Model A (baseline only); Model B (+procedure type); and Model C (+intraoperative variables: aortic cross-clamp time, intraoperative RBC units, and intraoperative inotrope use). Calibration was assessed by the Hosmer-Lemeshow test. Total cardiopulmonary bypass duration was not separately captured in the institutional database and is disclosed as a limitation. Result(s): AKI occurred in 174 of 553 patients (31.5%), and in-hospital mortality was 16.6% (92/553). Patients with AKI were older (median 77 vs. 68 years, p Result(s): AKI occurred in 174 of 553 patients (31.5%), and in-hospital mortality was 16.6% (92/553). Patients with AKI were older (median 77 vs. 68 years, p Result(s): AKI occurred in 174 of 553 patients (31.5%), and in-hospital mortality was 16.6% (92/553). Patients with AKI were older (median 77 vs. 68 years, p 2, p , p , p Conclusion(s): In cardiac-surgery patients with a prolonged ICU stay, AKI is independently associated with in-hospital mortality even after adjustment for operative variables. The univariable association between preoperative haemoglobin and AKI is attenuated after adjustment for procedure type and intraoperative transfusion exposure, suggesting confounding or mediation by operative and case-mix factors rather than an independent direct association. The contribution of this analysis is aetiological/analytical rather than predictive (modest discrimination, AUROC 0.67 for AKI),

3. Renal and cardiovascular outcomes and safety of SGLT2 inhibitors in patients aged ≥ 65 years with non-dialysis chronic kidney disease: a systematic review and meta-analysis of subgroup-level estimates derived from randomized trials.

Authors: Bao, Ziyang;Hu, Jingjia;Sun, Yue;Li, Xianfa;Lin, Riyang;Zhu, Caifeng and Yin, Jiazhen

Publication Date: 2026

Journal: BMC Cardiovascular Disorders

Abstract: BACKGROUND: Elderly patients with non-dialysis chronic kidney disease have high cardiorenal risk. SGLT2 inhibitors are considered to potentially provide combined renal and cardiac benefits. OBJECTIVE: To evaluate renal and cardiovascular outcomes and safety of SGLT2 inhibitors in patients aged ≥ 65 years with non-dialysis chronic kidney disease. METHODS: Randomized controlled trials from database inception to 2025-7-18 were systematically searched, and trials enrolling non-dialysis chronic kidney disease and reporting a ≥ 65 -year subgroup were included. The primary outcome was an adverse renal composite endpoint, and the key secondary outcome was a composite of cardiovascular death or heart failure hospitalization. Safety focused on genital mycotic infections and volume depletion/hypotension, and acute kidney injury (AKI) and diabetic ketoacidosis (DKA) were summarized descriptively. Random-effects models based on log HR or RR (REML, Hartung-Knapp) were used, pre-specified sensitivity analyses were performed, and the certainty of evidence was assessed using GRADE. RESULTS: Three double-blind trials including 5,831 patients aged ≥ 65 years were included. SGLT2 inhibitors reduced the risk of the adverse renal composite endpoint (HR = 0.68, 95% CI 0.52-0.89; I²=29.98%), and the risk of the composite of cardiovascular death or heart failure hospitalization (HR = 0.74, 95% CI 0.64-0.86; I²=35.53%). For safety, the risk of genital mycotic infections was increased (RR = 2.40, 95% CI 1.96-2.94; I²=23.85%), and the risk of volume depletion/hypotension was also increased (RR = 1.28, 95% CI 1.09-1.50; I²=0.00%); no signal of increased AKI was observed; DKA was very rare. GRADE rated the certainty of evidence as high for the renal outcome and moderate for the heart failure-related outcome. CONCLUSION: In patients aged ≥ 65 years with non-dialysis chronic kidney disease, SGLT2 inhibitors added to standard therapy achieve dual renal and cardiovascular benefits with a manageable safety profile, supporting their structured use with stratified monitoring. It is recommended that SGLT2 inhibitors be routinely included in treatment. Copyright © 2026. The Author(s).

4. Timing of renal-replacement therapy in patients with acute kidney injury and sepsis: a systematic review and meta-analysis.

Authors: Bin Sahaq Z.;Alotaibi S.M.A.;Ali M.A.M.;Alanzi R.K.;AlHayki G.;Almalki F.;Alshehri A.M.;Dandal F.;Al Kassih M.;Alshantiti A.I.;AlOtaibi H.F.;Elaraby A. and Alrashidi, F. S.

Publication Date: 2026

Journal: BMC Nephrology (pagination), pp. Date of Publication: 18 Jun 2026

Abstract: BACKGROUND: The optimal timing for initiating renal replacement therapy (RRT) in sepsis-associated acute kidney injury (AKI) patients remains controversial. Early RRT initiation offers benefits by preventing metabolic complications and fluid overload, while delayed initiation avoids unnecessary procedures and conserves resources. This systematic review and meta-analysis aimed to compare early versus delayed RRT strategies in adult patients with sepsis-associated AKI. METHOD(S): We conducted a comprehensive search on PubMed, Scopus, Web of Science, and Cochrane CENTRAL from inception to February 2026. We included randomized controlled trials (RCTs) and observational cohorts comparing early versus delayed RRT initiation in patients with sepsis-associated AKI. Outcomes included 28-day and 90-day mortality, multi-organ dysfunction score (MODS), and intensive care unit (ICU) and hospital length of stay. Data were pooled using random-effects models.

RESULT(S): Fifteen studies (4 RCTs, 11 retrospective cohorts) comprising 6,289 patients were included. Early RRT was associated with significant reduction in 28-day mortality compared to delayed RRT (RR 0.81, 95% CI: 0.68-0.95, $p = 0.01$; $I^2=31.38\%$). However, trim-and-fill analysis suggested potential publication bias, with adjusted estimates showing non-significance (RR 0.88, 95% CI: 0.75-1.04). No significant differences were observed for 90-day mortality (RR 0.85, 95% CI: 0.69-1.04, $p = 0.12$), MODS (MD 0.24, 95% CI: -0.94-1.42, $p = 0.69$), ICU length of stay (MD -1.76, 95% CI: -4.18-0.66, $p = 0.15$), or hospital length of stay (MD 0.34, 95% CI: -3.24-3.92, $p = 0.85$). **CONCLUSION(S):** Early RRT initiation in sepsis-associated AKI was associated with reduction in 28-day mortality rates but did not result in any differences of 90-days mortality rates, and was not associated with improvements in MODS, suggesting that timing alone may not substantially alter long-term outcomes in this high-risk population. These findings are driven from mixed study designs with heterogeneity among the included patients, underscoring the need for more individualized approaches to RRT initiation in the future trials. **TRIAL REGISTRATION:** Not applicable. Copyright © 2026. The Author(s).

5. Health and economic impact of introducing norovirus vaccination in England accounting for acute kidney injury: Model-based cost-effectiveness analysis.

Authors: Bolt, Hikaru;Gupte, Pratik R.;Tomlinson, Laurie A.;Eggo, Rosalind M. and Sandmann, Frank G.

Publication Date: Jul 28 ,2026

Journal: Epidemics 56, pp. 100937

Abstract: **BACKGROUND:** Norovirus vaccines are currently undergoing advanced clinical trials. Acute kidney injury (AKI) is a serious sequelae of norovirus infection. This study evaluated the health and economic impact of implementing a norovirus vaccination programme in England, and assessed the contribution of AKI. **METHODS:** We constructed a deterministic age-stratified dynamic-transmission compartmental model. Three single-dose norovirus vaccination strategies were compared to a no-vaccination strategy: targeting children under 5 years of age, targeting adults aged 65 years or older, and targeting both age groups simultaneously. We estimated the impact on preventing primary care attendances, hospitalisations, and mortality from symptomatic norovirus, as well as hospitalisations and mortality due to norovirus-related AKI in adults aged 65 years or older. We evaluated the cost effectiveness over a 10 year time horizon, from a healthcare payer perspective, and discounted costs and quality adjusted life years (QALYs) at 3.5%. We performed probabilistic sensitivity analysis. In one-way sensitivity analysis, we varied the vaccine prices and the proportion of AKI-linked norovirus hospitalisations. **RESULTS:** A combined vaccination strategy of targeting children and older adults reduced symptomatic infections by 64% (37-93%) and 66% (35-95%) in these age groups, respectively. When including AKI outcomes, all vaccination strategies were cost-effective at 35 per dose and 60% efficacy. At a willingness-to-pay of 20,000 per QALY gained, the combined vaccination strategy had a 94% probability of being the most cost-effective option. Even with a norovirus-related AKI hospitalisation rate as low as 3% among symptomatic norovirus-infected adults, the strategy remained cost-effective. When excluding AKI outcomes, all strategies were not cost-effective. **CONCLUSIONS:** Introducing a norovirus vaccine could be cost-effective in England when accounting for the AKI-related sequelae, which are critical for the health economic evaluation. Copyright © 2026 The Authors. Published by Elsevier B.V. All rights reserved.

6. Acute Kidney Injury After Mechanical Thrombectomy for Stroke in Patients With Pre-Existing Renal Impairment.

Authors: Boronczyk, Michal;Pilarek, Marcel;Jaworska, Emilia;Kardas, Natalia;Barnas, Oliwia;Wozniak, Julia;Machala, Iga;Wegrzynek-Gallina, Julia;Siuda, Joanna;Hawrot-Kawecka, Anna and Lasek-Bal, Anetta

Publication Date: 2026

Journal: Annals of Clinical & Translational Neurology

Abstract: OBJECTIVES: Acute kidney injury (AKI) is a common but often underrecognized complication in ischemic stroke patients undergoing mechanical thrombectomy, particularly among those with pre-existing renal impairment. This study evaluated the incidence, risk factors, and clinical impact of AKI in this high-risk population. METHODS: This retrospective, two-center study involved 310 patients who underwent MT for ischemic stroke and presented with impaired renal function at baseline (eGFR $\geq$ 30 mL/min/1.73 m²). AKI was defined according to the Kidney Disease: Improving Global Outcomes (KDIGO) criteria and categorized as post-contrast AKI (PC-AKI), which occurred within 48 h following contrast administration, and late-onset AKI (L-AKI), which developed later during hospitalization. We analyzed the clinical and laboratory factors that might predispose patients to the development of AKI and compared the clinical profiles of those with PC-AKI and L-AKI. RESULTS: Acute kidney injury occurred in 91 patients, including 49 with PC-AKI and 42 with L-AKI. Patients who developed AKI were more likely to have pre-existing chronic kidney disease, prior NSAIDs use, and higher serum glucose and potassium levels at admission. Additionally, AKI was associated with longer hospitalization, increased in-hospital and 3-month mortality, and less favorable clinical outcomes overall. The independent predictors of AKI included NIHSS > 15 (OR: 3.441), WBC count (OR: 1.128), female sex (OR: 0.311), and the comorbidity burden (OR: 2.414). INTERPRETATION: Acute kidney injury represents a frequent and clinically relevant complication following MT in patients with pre-existing renal impairment. Early recognition and the implementation of preventive strategies are essential, particularly in patients with established risk factors for AKI. Copyright © 2026 The Author(s). Annals of Clinical and Translational Neurology published by Wiley Periodicals LLC on behalf of American Neurological Association

7. Perioperative albumin versus other fluids to prevent cardiac surgery-associated kidney injury: a systematic review and meta-analysis of randomized trials.

Authors: Darlison, Phoebe R.;Shehabi, Yahya;Walker, Humphrey G. M.;Serpa Neto, Ary;Motorniak, David C.;Pakavakis, Adrian;Balachandran, Mayurathan;Wigmore, Geoffrey J.;Bellomo, Rinaldo and Brown, Alastair J. W.

Publication Date: 2026

Journal: Critical Care Science 38, pp. e20260353

Abstract: OBJECTIVE: Cardiac surgery-associated acute kidney injury is a common and serious complication of cardiac surgery. Albumin solution is a commonly administered fluid in cardiac surgery patients; the role of albumin in preventing cardiac surgery-associated acute kidney injury is unclear. The objective of this systematic review and meta-analysis was to evaluate the impact of perioperative albumin compared with other fluid regimens on the risk of acute kidney injury in cardiac surgical patients undergoing cardiopulmonary bypass. METHODS: A systematic search was performed of MEDLINE R, Embase, CINAHL, and Cochrane Central Register of Controlled Trials databases, and the Australian New Zealand Clinical Trials Registry, ClinicalTrials.gov, World Health Organization International Clinical Trials Registry Platform, and ISRCTN registries. Randomized trials of adult patients undergoing on-bypass cardiac surgery comparing albumin-containing solutions with any other fluid regimen given perioperatively were included. Trials comparing fluids used only for bypass priming were excluded. Data extraction, risk of bias, and certainty of evidence were assessed in duplicate by independent reviewers. A Bayesian framework was the primary statistical approach, with a secondary frequentist approach. The primary outcome was perioperative acute kidney injury, defined as the period from surgery until hospital discharge. Secondary outcomes were all-cause mortality at longest follow-up, intensive care unit length of stay, hospital length of stay, proportion of patients requiring renal replacement therapy postoperatively, duration of mechanical ventilation postoperatively, and duration of vasopressor support postoperatively. RESULTS: Fourteen randomized trials, including 3,304 adults, were included in the analysis. Seven trials contributed data to the primary outcome. Four trials had an overall low risk of bias across all domains and outcomes. The pooled estimated risk ratio for acute kidney injury with albumin solutions was 1.09 (95% credible interval 0.86 - 1.34, tau = 0.12; I² = 31.5%), with a 18.3% posterior probability of reduced acute kidney injury. There were no significant subgroup effects or differences in secondary outcomes. CONCLUSION: Among patients undergoing

on-bypass cardiac surgery, the use of albumin solutions is unlikely to reduce the risk of acute kidney injury. Other interventions need to be considered for this condition.

8. Lower Risk of Acute Kidney Injury in Hospitalized Patients Treated with SGLT-2 Inhibitors: A Retrospective Matched Cohort Study.

Authors: de Martines D.G.L.;Aydinoglu K.H.A.;Gant C.;Westra Y.;de Jong K. and Adema, A. Y.

Publication Date: 2026

Journal: Acta Cytologica (pagination), pp. Date of Publication: 2026

Abstract: Introduction: Recent studies have shown possible protective effects of sodium-glucose co-transporter-2 inhibitors (SGLT-2is) for acute kidney injury (AKI). As SGLT-2is have diuretic properties, uncertainty remains regarding their effect on the risk of AKI during hospital admission, where hypovolemia frequently occurs. Therefore, we assessed the association between (pre)hospital treatment with SGLT-2i and AKI risk in hospitalized patients. Method(s): We performed a matched cohort study. We identified hospitalized patients with prehospital use of SGLT-2i in the Frisius Medical Centre Leeuwarden, between October 21, 2021, and February 12, 2024. These were matched 1:1 to hospitalized patients without prehospital use of SGLT-2i. AKI incidence was the main outcome. Second, SGLT-2i treatment during hospitalization was assessed. Result(s): Overall, 1, 054 hospital admissions were included, 527 with and 527 without prehospital SGLT-2i use. Overall, 34% of patients were women; the median age was 71 years (IQR 65-78). SGLT-2i was indicated for heart failure in 16%, chronic kidney disease 6%, type 2 diabetes 7%, and at least two indications in 72%. Hospital-acquired AKIs occurred in 17.5% admissions with prehospital SGLT-2i treatment and 25.8% among those without (RR = 0.68 [95% CI = 0.53-0.86]). AKI risk was similarly decreased in patients continuing SGLT-2i during hospital admission (RR 0.65 [0.49-0.85]). AKI was associated with increased length of hospital stay (median 7 days, IQR 4-11, versus 3 days, IQR 1-7 without AKI); SGLT-2i use was not. Overall, SGLT-2i treatment did not affect overall mortality. In patients with AKI, mortality was numerically lower in SGLT-2i patients (risk difference = 7.8%, 95% CI -0.9-15.7%), although the confidence interval includes zero. Conclusion(s): We observed a 32% lower risk of AKI in hospitalized patients using SGLT-2i at admission. This suggest a protective effect of SGLT-2i against AKI, which remained when SGLT-2i was continued during hospitalization. Copyright © 2026 The Author(s). Published by S. Karger AG, Basel

9. Impaired fatty acid metabolism in AKI: experimental evidence - a narrative review

Authors: Gruzla, Johanna;Erfurt, Stefan;Marahrens, Benedikt;Weylandt, Karsten-Henrich;Ritter, Oliver and Patschan, Daniel

Publication Date: 2026

Journal: BMC Nephrology 27(1), pp. 07 13

Abstract: BACKGROUND: Acute kidney injury (AKI) is a common and serious complication of hospitalized patients worldwide. In most cases, the syndrome is characterized by dysfunction/structural damage of the tubular epithelial cells. The metabolic feature is a reduction in cellular adenosine triphosphate (ATP) synthesis as a result of decreased fatty acid oxidation. Stabilization of the fatty acid (FA) oxidation process may influence the course of AKI, whether caused by endogenous or exogenous factors. In this narrative review, we discuss experimental evidence on the modulation of fatty acid metabolism in AKI. METHODS: Narrative review article. The following databases were searched for references: PubMed, Web of Science, Cochrane Library, Scopus. The period lasted from 2010 until May 2026. RESULTS: Finally, 16 articles on the modulation of fatty acid metabolism in experimental AKI were identified. Disturbances in the FA oxidation process are associated with an aggravation of renal dysfunction in AKI, and lipids accumulate in the renal tissue itself. The consequences of exogenous fatty acid intake depend on the structural characteristics of the metabolites applied, as well as on the pattern of renal damage and the relevant pathophysiological processes. CONCLUSIONS:

Under certain conditions, adequate fatty acid oxidation may be considered nephroprotective; however, the complexity of the syndrome's pathophysiology must always be taken into account. Distinct fatty acids have the potential to offer therapeutic benefits in AKI cases. However, the efficacy of an FA-based therapeutic approach depends on two main factors: the chemical structure of the substances used and the nature of the underlying kidney disease. Copyright © 2026. The Author(s)

10. Mid-Term Exposure to Air Pollution and Acute Kidney Injury Incidence: A 10-Year Study in Eastern Poland.

Authors: Gryko, Adam;Kurasz, Anna;Malyszko, Jolanta;Dobrzycki, Slawomir and Kuzma, Lukasz

Publication Date: Jun 25 ,2026

Journal: Journal of Clinical Medicine 15(13)

Abstract: Background/Objectives: Air pollution is associated with many adverse health consequences, including deteriorated kidney function. The aim of the research was to determine the association of medium-term exposure to air pollutants and hospitalizations due to acute kidney injury (AKI). Methods: The retrospective population-based study was conducted on the EP-PARTICLES cohort between 2011 and 2020 (80,000,000 person-years). We estimated municipality-specific associations between air pollution and AKI admissions using generalized additive models with Poisson regression. Results are reported as risk ratio in AKI admissions (RR) with corresponding 95% confidence intervals (95% CI). Results: During the 10-year study period, 47,467 AKI cases were reported (median age 77 years, IQR 68-84; 51.2% women). Mean concentrations of pollutants were 21.4 microg/m³ (SD 5.2) for particulate matter with a diameter of 2.5 mcm or less (PM_{2.5}), 7.5 microg/m³ (1.8) for nitrogen dioxide (NO₂), and 1.8 ng/m³ (0.8) for benzo[a]pyrene (BaP). In mid-term exposure analyses (lag 0-30), each 10 microg/m³ increase in PM_{2.5}, PM₁₀, NO₂ and CO, and each 1 microg/m³ increase in BaP, was associated with higher AKI risk, with the strongest effect observed for NO₂ (RR 1.066, 95% CI 1.033-1.099). No association was found for SO₂. Subgroup analyses showed consistent directions of association across sex and age groups, with NO₂ remaining the most detrimental pollutant. Although statistical significance varied between pollutants, no significant effect modification by sex or age was observed ($p > 0.05$). Conclusions: Mid-term exposure to ambient air pollution is associated with an increased risk of AKI-related hospitalizations, with NO₂ showing the strongest effects. These findings identify mid-term exposure as a relevant temporal window and support the role of air pollution as a modifiable risk factor for AKI.

11. Risk prediction models for acute kidney injury in patients with acute pancreatitis: a systematic review.

Authors: Huang L.;Zang J.;Li J.;Li Y. and Ren, Z.

Publication Date: 2026

Journal: BMC Gastroenterology (pagination), pp. Date of Publication: 15 Jul 2026

Abstract: BACKGROUND: Acute kidney injury (AKI) is a life-threatening complication of acute pancreatitis (AP), significantly increasing mortality and extending hospital stay. Early identification of high-risk patients is crucial for timely intervention yet remains clinically challenging. Although several prediction models have been developed, their methodological quality, predictive performance, and clinical applicability vary greatly and lack comprehensive evaluation. A systematic synthesis of existing evidence is therefore imperative to inform clinical practice and guide future research. METHOD(S): Two reviewers examined Chinese databases (including CNKI, VIP, SinoMed, and Wanfang), along with PubMed, Web of Science, the Cochrane Library, Embase, and Scopus, to identify risk prediction models for AKI in patients with AP published from inception to December 2025. Two reviewers independently reviewed the literature, retrieved relevant information, and evaluated the risk of bias using the PROBAST tool. The main performance measures of the models, including AUC, calibration, validation method, and predictors, were retrieved. RESULT(S): Our review assessed 20 studies with

9481 patients. The prevalence of AKI varied between 13.8% and 72.8%. The reported AUCs of the prediction models ranged from 0.735 to 0.920. All 20 studies were assessed as having high overall risk of bias according to the PROBAST tool, primarily owing to retrospective study designs, lack of external validation, and incomplete model development processes. **CONCLUSION(S):** Existing AKI prediction models for AP patients show moderate to good apparent discrimination but are based on studies with uniformly high risk of bias. No model can be recommended for routine clinical use without prospective external validation. Copyright © 2026. The Author(s).

12. Burden and Outcomes of Acute Kidney Injury in Critically Ill Patients.

Authors: Ijas, Anakath M.;Rajasekharan, Gayathry;Sara Jacob, Chinthu;Anil, Vijayakumar and Chandrasekharan, Rajasekharan

Publication Date: Jun ,2026

Journal: Cureus 18(6), pp. e110291

Abstract: Introduction Acute kidney injury (AKI) represents a frequent and serious complication among patients requiring intensive care. This syndrome is a primary driver of elevated morbidity and mortality, while also leading to extended hospital stays and an increased susceptibility to future chronic kidney disease (CKD). Early identification of both risk factors and etiological factors is essential for timely intervention and improved clinical outcomes. The study aimed to evaluate the clinical characteristics, demographic profiles, and etiological risk factors of critically ill patients presenting with AKI and compare the outcomes of patients with and without sepsis. Methods A longitudinal observational study was conducted in the medical and surgical intensive care units (ICUs) of a tertiary care hospital in Kerala between February 2021 and August 2022. A total of 77 adult patients diagnosed with AKI based on the Kidney Disease: Improving Global Outcomes (KDIGO) criteria were included in the study. Clinical characteristics, laboratory parameters, etiologies, management strategies, and outcomes were analyzed using IBM SPSS Statistics software, version 25 (IBM Corp., Armonk, NY, USA). A p-value of less than 0.05 was considered statistically significant. Results The overall mortality rate within the enrolled AKI cohort was 21 (27.3%). The majority of the patients were male (50, 64.9%) and over the age of 60 years (35, 45.4%). Community-acquired AKI (CAAKI) constituted 56 (72.7%) of the cases, while hospital-acquired AKI (HAAKI) accounted for 21 (27.2%) cases. Sepsis was identified as the leading cause of AKI at 26 (33.7%), followed by poisoning (13, 16.9%) and cardiac etiologies (14, 18.2%). Mortality was not significantly associated with age, gender, AKI type, or laboratory parameters, including hemoglobin levels or thrombocytopenia. However, mortality was significantly associated with metabolic acidosis ($p=0.004$), hyperbilirubinemia ($p=0.037$), and higher KDIGO stages (chi-square (χ^2)=6.11, $p=0.047$). Among the 56 survivors, complete renal recovery was achieved in 47 patients (84.8%), partial recovery was observed in six patients (10.4%), and three patients (5.4%) remained dialysis-dependent at the follow-up period. Conclusion AKI remains a pervasive complication among the critically ill, where it continues to be linked with considerable fatality rates within the intensive care setting. Sepsis is the predominant etiology. Higher KDIGO stages, metabolic acidosis, and hyperbilirubinemia are significant predictors of poor outcomes. Early detection and prompt management of reversible factors may significantly improve survival rates. Copyright © 2026, Ijas et al.

13. Impact of non-selective beta-blockers on acute kidney injury outcomes in patients with decompensated cirrhosis.

Authors: Incicco, Simone;Patidar, Kavish R.;Juanola, Adria;Ma, Ann T.;Barone, Anna;Kulkarni, Anand V.;Perez Hernandez, Jose Luis;Asrani, Sumeet K.;Wentworth, Brian;Alessandria, Carlo;Abdelkader, Nadia Abdelaaty;Wong, Yu Jun;Xie, Qing;Pyrasopoulos, Nikolaos T.;Kim, Sung-Eun;Fouad, Yasser;Torre, Aldo;Reyes, Eira Cerda;Diaz-Ferrer, Javier;Maiwall, Rakhi, et al

Publication Date: 2026

Journal: Journal of Hepatology

Abstract: BACKGROUND & AIMS: Non-selective beta-blockers (NSBBs) are widely used to prevent decompensation in cirrhosis. Guidelines recommend discontinuing NSBBs in patients with cirrhosis and acute kidney injury (AKI), although this recommendation is based largely on expert opinion and limited evidence. We evaluated the impact of NSBB use on AKI outcomes in patients with cirrhosis. METHODS: This multicenter study enrolled patients hospitalized for decompensated cirrhosis and AKI. Data on NSBB treatment, including type, dose, and continuation, discontinuation, or tapering, were collected. Outcomes were compared between patients receiving and not receiving NSBBs and between those who discontinued/tapered and those who did not. Inverse probability of treatment weighting (IPTW) was used to balance demographics, liver disease severity, hemodynamic parameters, AKI stage and acute-on-chronic liver failure (ACLF) grade. The main outcomes were AKI resolution and 28-day mortality. RESULTS: Of 1,238 patients with AKI, 503 were on NSBBs (propranolol 55%; carvedilol 45%). After IPTW adjustment, NSBB treatment at AKI diagnosis was associated with higher likelihood of AKI resolution (subdistribution hazard ratio [sHR] 1.29; 95% CI 1.12-1.48; p : Of 1,238 patients with AKI, 503 were on NSBBs (propranolol 55%; carvedilol 45%). After IPTW adjustment, NSBB treatment at AKI diagnosis was associated with higher likelihood of AKI resolution (subdistribution hazard ratio [sHR] 1.29; 95% CI 1.12-1.48; p CONCLUSION: NSBB use at AKI diagnosis was associated with improved renal recovery and survival in patients with acutely decompensated cirrhosis and AKI. Continuation during hospitalization does not appear harmful, supporting careful individualized management rather than systematic withdrawal. IMPACT AND IMPLICATIONS: Owing to potential adverse hemodynamic effects, current guidelines recommend discontinuation of non-selective beta-blockers (NSBBs) in patients with acute decompensation (AD) of cirrhosis and acute kidney injury (AKI). However, this recommendation relies largely on expert opinion, since robust clinical evidence is lacking. This study prospectively evaluated the impact of NSBBs on AKI outcomes in a large multicentre cohort of patients with AD and AKI. Treatment with NSBBs at AKI diagnosis was associated with greater likelihood of AKI resolution and lower risk of 28-day mortality, while no evidence of an association between early discontinuation and improved outcomes was observed. These findings support a personalized approach to NSBB management in decompensated patients with AKI and highlight the need to identify patients who may benefit most from NSBB discontinuation. Copyright © 2026 The Author(s). Published by Elsevier B.V. All rights reserved.

14. The prevalence and risk factors of acute kidney injury in post-orthopedic surgery patients.

Authors: Li, Wen;Fu, Chenfei;Fu, Wenjing and Zhang, Aihua

Publication Date: 2026

Journal: Frontiers in Medicine 13, pp. 1825528

Abstract: Purpose: This study aimed to investigate the prevalence and identify the risk factors associated with acute kidney injury (AKI) in patients undergoing orthopedic surgery. Methods: A retrospective study was conducted on 2,796 patients admitted to the orthopedic ward for bone tumors, bone injuries, and spinal diseases between 2017 and 2020. Patients were categorized into non-AKI, AKI stage 1-2, and AKI stage 3 groups. Data were analyzed using chi-square, Fisher's exact, Kruskal-Wallis tests, and logistic regression to compare groups and determine independent risk factors for AKI. Results: AKI occurred in 97 patients, yielding an overall prevalence of 3.47%. The incidence was highest among patients undergoing bone tumor surgery (11.36%) and lowest in those undergoing spinal surgery (2.46%). Patients in the AKI stage 3 group had a significantly higher proportion of bone tumor surgeries and longer hospital stays compared to other groups (P Conclusion: There is a significant risk of AKI following orthopedic surgery, particularly in patients undergoing bone tumor procedures. The study underscores several key modifiable risk factors, including the use of PPIs and NSAIDs, as well as preoperative conditions like proteinuria, anemia, and elevated urea. Copyright © 2026 Li, Fu, Fu and Zhang.

15. Non-steroidal mineralocorticoid receptor antagonists in non-diabetic kidney disease: a narrative review of mechanisms and clinical advances

Authors: Luo, Fei;Hu, Jingjia;Fang, Hongliang;Li, Xianfa;Zhu, Caifeng and Bao, Ziyang

Publication Date: 2026

Journal: BMC Nephrology

Abstract: Significant advances have been made in elucidating the role of non-steroidal mineralocorticoid receptor antagonists (ns-MRAs) in non-diabetic kidney disease (NDKD). As a key downstream effector of the renin-angiotensin system (RAS), pathological overactivation of the mineralocorticoid receptor (MR) amplifies inflammatory and fibrotic signaling, thereby contributing to proteinuria, podocyte injury, and progressive damage to both the glomerular and tubulointerstitial compartments. Mechanistic studies suggest that ns-MRAs exert multi-level protective effects by targeting the inflammation-fibrosis axis, including preservation of podocyte structure and function, attenuation of acute kidney injury-to-chronic kidney disease transition, improvement of endothelial dysfunction, and suppression of cardiac and renal fibrosis. Clinically, the phase III FIND-CKD trial has provided direct randomized evidence that finerenone slows estimated glomerular filtration rate (eGFR) decline in adults with proteinuric CKD without diabetes, while a prespecified exploratory analysis further supports its potential relevance in glomerular diseases. Real-world studies in IgA nephropathy and membranous nephropathy also suggest antiproteinuric effects when finerenone is added to renin-angiotensin system inhibition. Moreover, co-administration with sodium-glucose cotransporter 2 (SGLT2) inhibitors may confer complementary antiproteinuric effects, although hyperkalemia remains an important safety consideration requiring appropriate monitoring. Collectively, current randomized and observational evidence supports consideration of ns-MRAs in selected patients with proteinuric NDKD, while highlighting the need for subtype-specific interpretation, serum potassium monitoring, and precision-stratified treatment strategies. Copyright © 2026. The Author(s).; Publisher CLINICAL TRIAL REGISTRATION: Clinical trial number: Not applicable. Registration date: Not applicable. Language: German

16. Safety of Ketorolac in Primary Total Hip Arthroplasties: An Analysis of Over 7,000 Cases.

Authors: Meissner, Nils;Bonakdarhashemi, Moein;Leung, Nelson;Duncan, Christopher M.;Mabry, Tad M.;Taunton, Michael J.;Hannon, Charles P. and Abdel, Matthew P.

Publication Date: 2026

Journal: Journal of Arthroplasty

Abstract: BACKGROUND: Ketorolac is commonly utilized perioperatively in primary total hip arthroplasty (THA), either intravenously or via periarticular infiltration analgesia. While effective for pain control, concerns remain regarding its potential to cause acute kidney injury (AKI), particularly in patients who have chronic kidney disease (CKD). This study evaluated the association between perioperative ketorolac administration and postoperative AKI, stratified by baseline renal function and administration route. METHODS: We retrospectively analyzed 7,211 inpatient THAs performed between 2011 and 2021. An AKI was defined according to Kidney Disease: Improving Global Outcomes criteria. Multivariable logistic regressions evaluated the association between perioperative ketorolac administration and in-hospital AKI, adjusting for demographic and clinical covariates. Subgroup analyses were conducted for patients who had (15%) and did not have (85%) preexisting CKD. Ketorolac was administered perioperatively in 35% of cases (25% periarticular infiltration analgesia, 7% intravenously, and 3% both) with a median cumulative dose of 30 mg (range, 15 to 90 mg). The mean age was 66 years, mean body mass index (BMI) 31 and 51% were women. RESULTS: An AKI occurred in 3.4% of cases. Ketorolac use was not associated with increased AKI risk (odds ratio (OR) 0.8; P = 0.08), regardless of administration route (all OR less than 1; all P > 0.05). Chronic kidney disease was an independent risk factor for the development of AKI (OR, 4.1; P : An AKI occurred in 3.4% of cases. Ketorolac use was not associated with increased AKI risk (odds ratio (OR) 0.8; P =

Publication Date: Jul ,2026

Journal: Cureus 18(7), pp. e113025

Abstract: Sodium-glucose cotransporter-2 (SGLT2) inhibitors have become a cornerstone of heart failure (HF) therapy, yet the totality of randomized evidence - including smaller trials beyond the landmark cardiovascular (CV) outcome studies - has not been comprehensively synthesized. We searched PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform (ICTRP) from inception to March 2026 for randomized controlled trials (RCTs) comparing any SGLT2 inhibitor or the dual sodium-glucose cotransporter-1/2 (SGLT1/SGLT2) inhibitor sotagliflozin with placebo or standard care in adults with HF. Random-effects Mantel-Haenszel risk ratios (RRs) with Hartung-Knapp-Sidik-Jonkman (HKSJ) confidence intervals (CIs) were used. Certainty of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. The protocol was prospectively registered with the International Prospective Register of Systematic Reviews (PROSPERO; CRD420251167908). Of 6,239 records identified, 114 studies met inclusion criteria and 59 RCTs (29,692 participants) were included in the quantitative synthesis. SGLT2 inhibitors reduced all-cause mortality (ACM; RR 0.90, 95% CI 0.83-0.98; $p = 0.016$; 26 trials; low certainty), although trim-and-fill adjustment for publication bias attenuated the finding (adjusted RR 0.92, 95% CI 0.84-1.00). HF hospitalization (HFH) was reduced (RR 0.74, 95% CI 0.69-0.79; 15 trials; moderate certainty), as were CV death (RR 0.86, 95% CI 0.76-0.98; seven trials; moderate certainty), the composite of CV death and HFH (RR 0.80, 95% CI 0.75-0.85; eight trials; high certainty), and serious adverse events (RR 0.94, 95% CI 0.90-0.99; 20 trials; high certainty). Genital infections were significantly increased (RR 3.75, 95% CI 1.72-8.19); no significant increases were observed for diabetic ketoacidosis (DKA), acute kidney injury (AKI), urinary tract infection (UTI), or hypotension. Subgroup analyses showed a greater ACM benefit in HF with reduced ejection fraction (HFrEF) than in HF with preserved ejection fraction (HFpEF) (interaction $p = 0.039$). Results were directionally consistent across 13 sensitivity scenarios and five alternative statistical models. SGLT2 inhibitors reduce HFH, CV death, the composite endpoint, and serious adverse events with moderate-to-high certainty; the all-cause mortality reduction is of low certainty and sensitive to publication bias. Copyright © 2026, Muller Ferreira et al.

19. COVID-19 and Diabetes: Clinical Symptoms, Acute Kidney Injury, Inflammatory Response, and Poor Prognosis Factors.

Authors: Ozer Sensoy, Nur; Usta, Mehmet; Gurcuoglu, Emel; Ersoy, Alparslan and Buyukuysal, Mustafa Gagatay

Publication Date: Jul 11 ,2026

Journal: Medical Science Monitor 32, pp. e951864

Abstract: BACKGROUND COVID-19 is associated with morbidity and mortality, particularly among patients with metabolic comorbidities. Diabetes mellitus may adversely affect COVID-19 outcomes. This study aimed to compare demographic, clinical, laboratory, renal, inflammatory, treatment-related, and mortality-related characteristics between COVID-19 patients with and without diabetes. MATERIAL AND METHODS This retrospective observational study included 400 hospitalized COVID-19 patients classified as diabetic or non-diabetic using hospital records. Demographic characteristics, comorbidities, clinical presentations, laboratory findings, renal function markers, acute kidney injury, treatment variables, systemic immune-inflammation index (SII), and 90-day all-cause mortality were compared. ROC analysis assessed the discriminatory ability of admission SII for predicting 90-day mortality, and multivariable logistic regression was performed. RESULTS A total of 400 patients were included, including 130 with diabetes and 270 without. Patients in the diabetic group were older and had higher rates of hypertension and coronary artery disease. Respiratory symptoms and pneumonia were more frequent in the diabetic group. Renal function markers were significantly higher in the diabetic group; however, acute kidney injury, ICU admission, mechanical ventilation rates, and SII did not differ significantly between groups. During 90-day follow-up, mortality was higher in the diabetic group (15.4% vs 8.1%; $P=0.030$). In multivariable analysis, age, coronary artery disease, and SII

greater than 2135.28 were associated with 90-day mortality. Admission SII showed modest discriminatory ability for predicting mortality (AUC=0.623; P=0.015). **CONCLUSIONS** Among patients hospitalized with COVID-19, diabetes was associated with higher comorbidity burden, respiratory involvement, altered renal function markers, and higher unadjusted 90-day mortality. Adjusted mortality was associated with age, coronary artery disease, and high admission SII.

20. Dual-phase CT radiomics for acute kidney injury prediction after out-of-hospital cardiac arrest.

Authors: Scheschenja, Michael;Hekers, Lisa;Kreutz, Julian;Markus, Birgit;Betz, Susanne;Jedelska, Jarmila;Konig, Alexander;Mahnken, Andreas H. and Viniol, Simon

Publication Date: 2026

Journal: Frontiers in Radiology 6, pp. 1875412

Abstract: Background: Acute kidney injury (AKI) is common and prognostically relevant after out-of-hospital cardiac arrest (OHCA), yet early risk prediction at admission remains limited. Objective: To assess whether radiomics features from dual-phase contrast-enhanced CT obtained at admission predict AKI after non-traumatic OHCA. Methods: This retrospective single-center study included consecutive non-traumatic OHCA patients with return of spontaneous circulation undergoing standardized admission dual-phase CT. AKI within 5 days was defined by KDIGO criteria or renal replacement therapy. Bilateral whole-kidney masks were generated using TotalSegmentator, reviewed, and corrected if necessary. Radiomics features were extracted with PyRadiomics within 3DSlicer. Features with poor reproducibility (CCC : This retrospective single-center study included consecutive non-traumatic OHCA patients with return of spontaneous circulation undergoing standardized admission dual-phase CT. AKI within 5 days was defined by KDIGO criteria or renal replacement therapy. Bilateral whole-kidney masks were generated using TotalSegmentator, reviewed, and corrected if necessary. Radiomics features were extracted with PyRadiomics within 3DSlicer. Features with poor reproducibility (CCC post hoc repeated resampling of the primary radiomics LR model across 100 stratified 70/30 splits, summarizing repetitions yielding 3-9 LASSO-selected features. Results: Of 383 screened patients, 155 were included, of which 47 (30.3%) developed AKI. In the test cohort, radiomics-LR showed the highest AUC (0.783), with kNN (0.778) and SVM (0.757) performing comparable. The limited clinical model performed poorly (AUC 0.549), and the combined model (AUC 0.779) did not materially improve upon radiomics alone. In the repeated resampling analysis, 29 of 100 repetitions fulfilled the predefined feature-count criterion. Among these repetitions, median test-set AUC was 0.663 (IQR, 0.623-0.699), indicating moderate but variable discriminatory performance and limited feature-selection stability. Most selected predictors were arterial-venous difference features. Conclusions: This exploratory single-center proof-of-concept study suggests that admission dual-phase CT radiomics may contain information relevant to early AKI risk stratification after OHCA, with arterial-venous difference features appearing particularly informative. However, limited stability of feature selection and model performance indicates that these findings should be considered hypothesis-generating and require methodological refinement, comparison with more comprehensive clinical models, and external validation in prospective multicenter cohorts before clinical application can be considered. Copyright © 2026 Scheschenja, Hekers, Kreutz, Markus, Betz, Jedelska, Konig, Mahnken and Viniol.

21. Thyroid Stimulating Hormone Levels and Risk of Hospital-Acquired Acute Kidney Injury: A Nationwide Cohort Study.

Authors: She, Caoxiang;Lin, Yaduan;Xie, Yanan;Zhou, Shiyu;Luo, Fan;Chen, Ruixuan;Jin, Luhua;Li, Lantian;Chen, Linjiang;Shao, Xian and Nie, Sheng

Publication Date: Aug ,2026

Journal: Kidney Medicine 8(8), pp. 101414

Abstract: Rationale & Objective: The thyroid-renal interaction remains underexplored in acute kidney injury pathophysiology. We aimed to investigate the relationship between thyroid status, defined by thyroid-stimulating hormone (TSH) levels, and incident hospital-acquired acute kidney injury (HA-AKI). Study Design: A retrospective cohort study. Setting & Participants: Patients with TSH quantification within 48 hours after admission from the China Renal Data System (CRDS) database. Exposures: Three TSH levels groups, including hyperthyroid (TSH > 5.0 mIU/L), euthyroid (TSH 0.1–5.0 mIU/L), and hypothyroid (TSH < 0.1 mIU/L) TSH levels. Outcomes: The primary outcome was HA-AKI. Analytical Approach: Multivariable Cox hazard regression models and restricted cubic spline. Results: A total of 20,317 (5.4%) patients developed HA-AKI, with incidences rates of 8.0%, 5.0%, and 6.4% in patients with hyperthyroid, euthyroid, and hypothyroid TSH levels, respectively. Compared with patients with euthyroid TSH levels, those with hyperthyroid or hypothyroid TSH levels were associated with an increased risk of HA-AKI (hyperthyroid TSH levels: adjusted hazard ratio [aHR], 1.28; 95% confidence interval [CI], 1.21–1.37; P = 0.03). Additionally, the dose-response curve showed a U-shaped relationship between TSH levels and the risk of new-onset HA-AKI. Limitations: Possible residual confounding. Conclusions: TSH levels in the low (5.0 mIU/L) ranges were associated with increased risk of HA-AKI. These insights suggest that enhanced vigilance toward AKI may be justifiable in patients with thyroid dysfunction. Copyright © 2026 The Authors.; plain-language-summary The relationship between thyroid dysfunction and chronic kidney disease (CKD) has been extensively studied. However, there is a lack of consensus regarding whether thyroid disorders increase the risk of acute kidney injury (AKI). To address this issue, this national cohort study used thyroid-stimulating hormone (TSH) levels as the primary exposure variable to assess thyroid function, categorizing them into three groups and evaluating the relationship between TSH levels and incident hospital-acquired acute kidney injury (HA-AKI). The results demonstrated that TSH levels in both low and high levels were associated with an increased risk of HA-AKI. Disruptions in the thyroid axis may serve as a predictor of patient outcomes. Therefore, prompt evaluation of thyroid function may be recommended to detect AKI in high-risk populations. Language: English

22. Multicenter validation of a severity index model for predicting postoperative acute kidney injury.

Authors: Sim J.H.;Oh A.R.;Chung J.;Ju J.W.;Nam K.;Kim S.;Park B. and Kim, J. U.

Publication Date: 2026

Journal: Journal of Internal Medicine 300(3), pp. 329–344

Abstract: Background: Existing models for predicting postoperative acute kidney injury (AKI) after non-cardiac surgery are often complex and insufficiently validated for broad clinical use. We developed and externally validated a simple yet accurate model for predicting both overall and critical AKI that can be readily applied in routine practice. Method(s): The severity index model for AKI (SIM-AKI) was developed using data from 191,938 patients undergoing non-cardiac surgery at a tertiary hospital and externally validated using three independent datasets from other tertiary hospitals (n = 118,047; 86,092; 3727). Variables were selected using least absolute shrinkage and selection operator regression with 10-fold cross-validation, and predictor stability was assessed using backward elimination across 100 bootstrap resamples before multinomial logistic regression modeling. Model performance was evaluated using the C-statistic for discrimination, calibration plots, Brier scores, and decision curve analysis (DCA) for clinical utility. Result(s): The SIM-AKI model incorporated age, sex, diabetes mellitus, American Society of Anesthesiologists classification, cancer surgery, emergency status, major abdominal surgery, anemia, hypoalbuminemia, estimated glomerular filtration rate, intraoperative transfusion, and operation time. For overall AKI, C-statistics were 0.801 (95% CI 0.796–0.806) in development and 0.754, 0.742, and 0.759 in validation cohorts. For critical AKI, C-statistics were 0.838 (95% CI 0.826–0.850) in development and 0.796, 0.805, and 0.767 in validation cohorts, demonstrating good calibration and clinical benefit in DCA. The SIM-AKI compared favorably with existing AKI prediction models in discrimination. Conclusion(s): SIM-AKI may serve as a reliable perioperative tool for predicting the risk of both overall and critical postoperative AKI in patients undergoing non-cardiac surgery. Copyright © 2026 The Association for the Publication of the Journal of Internal Medicine.

23. Acute Kidney Injury in Adults Exposed to Commonly Used Nephrotoxic Medications and Iodinated Contrast: Frequency, Associated Factors, and Early Outcomes.

Authors: Varun, Madala;Kolla, Saieesha Chowdary;Naveen, Aalasyam;Koya, Prakhya Chowdary and Sayana, Suresh Babu

Publication Date: Jun ,2026

Journal: Cureus 18(6), pp. e111155

Abstract: Background Acute kidney injury (AKI) in hospitalized adults is often framed as an unavoidable consequence of critical illness. Yet a substantial proportion emerges within a modifiable clinical space: exposure to nephrotoxic medications, iodinated contrast, hemodynamic stress, and delayed renal monitoring. This study evaluated whether high nephrotoxic exposure was associated with in-hospital AKI among adult inpatients after balancing measured baseline risk. Methods This prospective observational cohort study included adult inpatients admitted to general wards and intensive care units at Mamata Medical College and General Hospital, Khammam, India. From 1,500 admissions, 240 patients with high nephrotoxic medication exposure and/or iodinated contrast exposure were identified and matched 1:1 with 240 unexposed controls using propensity-score matching. Matching variables included age, sex, body mass index, diabetes mellitus, congestive heart failure, baseline serum creatinine, estimated glomerular filtration rate, blood urea nitrogen, and intensive care unit status. AKI was defined according to the Kidney Disease: Improving Global Outcomes criteria, primarily using serum creatinine changes. A sensitivity analysis excluded very mild Stage 1a AKI. The primary outcome was in-hospital AKI after the index date; secondary outcomes included AKI severity, Stages 2-3 AKI, time to AKI among AKI cases, in-hospital mortality, length of stay, vancomycin concentration patterns, and medication-specific AKI-overlapping exposure burden. Results After matching, baseline characteristics were generally balanced, although blood urea nitrogen remained modestly imbalanced. AKI occurred in 61 exposed patients and 38 controls, corresponding to 25.4% versus 15.8% and an odds ratio of 1.81 (95% CI, 1.15-2.85; $p = 0.013$). Severe AKI was numerically higher in exposed patients but did not reach statistical significance. After excluding Stage 1a AKI, clinically meaningful AKI remained more frequent in the exposed group, 17.5% versus 10.0% (OR, 1.91; 95% CI, 1.12-3.27; $p = 0.024$). Vancomycin, iodinated contrast, piperacillin-tazobactam, antivirals, and calcineurin/mammalian target of rapamycin (mTOR) inhibitors contributed prominently to AKI-overlapping exposure days. Maximum vancomycin concentrations were higher among patients who developed AKI, although reverse causality could not be excluded. Conclusion High nephrotoxic medication and/or iodinated contrast exposure was associated with a higher frequency of in-hospital AKI in matched adult inpatients. The association persisted after excluding minor creatinine-only events, supporting a clinically meaningful renal injury signal. These findings strengthen the need for nephrotoxin stewardship, early creatinine surveillance, dose adjustment, hydration optimization, and active multidisciplinary review when renal-risk medications are clinically unavoidable. Copyright © 2026, Varun et al.

24. Renal glucose metabolic enzyme expression during AKI-to-CKD transition.

Authors: Yan, Chaoyan;Zhu, Yuting;Liu, Mingming;Yang, Die;Zha, Yan;Long, Yanjun and Dong, Rong

Publication Date: 2026

Journal: International Urology & Nephrology

Abstract: The kidney is a high-energy-consuming organ, and glucose is one of its principal fuel sources. It has been documented that disturbed renal glucose metabolism occurs in acute kidney injury (AKI), but whether these disturbances are consistent in different types of AKI, and how they change during the transition from AKI to chronic kidney disease (CKD), remain to be addressed. In this study, we used AKI models induced by cisplatin (20 mg/kg, 48 h), lipopolysaccharide (10 mg/kg, 48 h), and ischemia-reperfusion (48 h) to mimic distinct etiologies, and the catalytic enzymes involved in glucose

transport, gluconeogenesis, and glycolysis were evaluated at both mRNA and protein levels by qPCR and immunofluorescence, respectively. In AKI, sodium-glucose cotransporter 2 (SGLT2) and fructose-1,6-bisphosphatase 1 (FBP1) protein levels were decreased, whereas the glycolytic enzymes hexokinase 2 (HK2), phosphofructokinase muscle type (PFKM), and pyruvate kinase M2 (PKM2) protein levels were increased. During the AKI-to-CKD transition, SGLT2 remained low; HK2, PFKM, PKM2, and FBP1 displayed a biphasic pattern (early rise, late fall) that varied with injury dose and time. These findings describe the expression changes of glucose metabolic enzymes during AKI and the AKI-to-CKD transition. Direct measurements of glycolytic activity were not performed; therefore, the relationship between these expression changes and actual metabolic function remains to be determined. This study provides a descriptive foundation for future investigations of glucose metabolism during the AKI-to-CKD transition. Copyright © 2026. The Author(s), under exclusive licence to Springer Nature B.V.

25. Construction and validation of a machine learning-based prediction model for in-hospital acute kidney injury in patients with lung cancer complicated with sepsis: clinical and nursing applications.

Authors: Zhang, Huiping and Zhang, Jinyan

Publication Date: Jun 30 ,2026

Journal: Journal of Thoracic Disease 18(6), pp. 613

Abstract: Background: Acute kidney injury (AKI) represents a critical complication in patients with lung cancer (LC) complicated by sepsis, exerting a substantial adverse impact on their prognosis. However, to date, no studies have been conducted to predict the risk of AKI in this specific patient population. The primary objective of this study is to develop and rigorously validate seven machine learning (ML) algorithms tailored to predict the probability of in-hospital AKI in patients with LC complicated by sepsis, while simultaneously evaluating their utility in clinical and nursing workflows. Methods: We retrieved retrospective clinical records pertaining to LC patients presenting with concurrent sepsis directly from the Medical Information Mart for Intensive Care (MIMIC)-IV dataset. All the independent variables were derived from the first measurement records within 24 h after the patient's admission, the AKI diagnosis period was from 24 h after admission until discharge. Subsequent to a rigorous data preprocessing phase, we employed a randomized splitting protocol to segregate the dataset into distinct training (70%) and testing (30%) cohorts. To authenticate model generalizability, an external validation phase was executed utilizing records from the electronic Intensive Care Unit Collaborative Research Database (eICU-CRD). Feature selection was accomplished through the deployment of both univariate and multivariate logistic regression (LR) methodologies. Seven ML models were developed model performance was evaluated using a comprehensive suite of metrics, prominently including the area under the curve (AUC), sensitivity and accuracy. Additionally, the optimal model was subjected to interpretability analysis utilizing Shapley additive explanations (SHAP). Results: In the MIMIC-IV dataset, 523 cases developed AKI, accounting for 79.00%. Among them, 362 cases were male (54.68%), with an average age of (standard deviation) 68.76 (10.89) years, and body mass index (BMI) was 31.34 (141.57) kg/m², etc. Our analysis identified a distinct profile of independent predictors for in-hospital AKI within this population, specifically: age, body weight, prothrombin time (PT), Acute Physiology Score III (APSIII) score, calcium, glucose, sodium, and potassium. Of the seven ML architectures evaluated, the neural network (NNET) yielded the highest predictive performance, securing AUC values of 0.864 (training), 0.760 (testing), and 0.785 (validation). Conclusions: By integrating variables such as age, weight, PT, APSIII score, and key electrolytes, the NNET model functions as a potential prognostic instrument for estimating in-hospital AKI risk in patients with LC complicated by sepsis. Copyright © AME Publishing Company.

26. Comorbidity phenotypes and the incidence and severity of acute kidney injury in older critically ill patients: a retrospective cohort study.

Authors: Zhang, Liang;Hao, Zhi-Yi;Li, Man;Liu, Jian-Qi;Su, Meng;Zhang, Zi-Hao;Yue, Shuo-Ying;Liu, Yuan-Yuan;Li, Chang-Ping and Ma, Jun

Publication Date: 2026

Journal: BMC Geriatrics

Abstract: BACKGROUND: The impact of specific comorbidity combinations on the risk and severity of acute kidney injury (AKI) in older critically ill patients remains unclear. This study aimed to identify comorbidity phenotypes using latent class analysis (LCA) and quantify their associations with hospital-acquired AKI. METHODS: We conducted a retrospective study using the MIMIC-IV database on first-time ICU patients (> 65 years) with a length of stay $\geq$ 48 h. Patients with baseline chronic kidney disease (CKD) or early-onset AKI were excluded. LCA was applied to baseline chronic conditions to identify distinct comorbidity phenotypes. Subsequently, we employed multivariable Cox proportional hazards models to evaluate AKI incidence, and logistic regression to assess AKI severity (KDIGO Stage $\geq$ 2), adjusting for potential confounders. RESULTS: Of 5,721 eligible patients, 2,202 (38.5%) developed hospital-acquired AKI. LCA identified five phenotypes: Class 1 (Low Comorbidity), Class 2 (Respiratory & Nicotine), Class 3 (Isolated Metabolic & Atherosclerosis), Class 4 (Atrial Fibrillation & Complex Cardiac), and Class 5 (Ischemic Heart Failure). Compared to Class 1, Class 4 showed the highest AKI risk (HR 1.52, 95% CI 1.29-1.79, P : Of 5,721 eligible patients, 2,202 (38.5%) developed hospital-acquired AKI. LCA identified five phenotypes: Class 1 (Low Comorbidity), Class 2 (Respiratory & Nicotine), Class 3 (Isolated Metabolic & Atherosclerosis), Class 4 (Atrial Fibrillation & Complex Cardiac), and Class 5 (Ischemic Heart Failure). Compared to Class 1, Class 4 showed the highest AKI risk (HR 1.52, 95% CI 1.29-1.79, P : Of 5,721 eligible patients, 2,202 (38.5%) developed hospital-acquired AKI. LCA identified five phenotypes: Class 1 (Low Comorbidity), Class 2 (Respiratory & Nicotine), Class 3 (Isolated Metabolic & Atherosclerosis), Class 4 (Atrial Fibrillation & Complex Cardiac), and Class 5 (Ischemic Heart Failure). Compared to Class 1, Class 4 showed the highest AKI risk (HR 1.52, 95% CI 1.29-1.79, P CONCLUSION: Distinct comorbidity phenotypes significantly influence the incidence and severity of hospital-acquired AKI. Phenotypes characterized by Atrial Fibrillation and Ischemic Heart Failure represent the highest-risk groups for severe renal outcomes, highlighting the potential value of targeted renal surveillance and individualized hemodynamic management in older critically ill patients. Copyright © 2026. The Author(s).

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