Royal United Hospitals Bath
NHS Foundation Trust

AKI

Current Awareness Bulletin

October 2025

Our Current Awareness Bulletins provide details of recently published articles in a given subject. They are a quick and easy way to keep up to date.

Please contact the Academy Library to request any articles:

ruh-tr.library@nhs.net

01225 82 4897/4898

Carry out basic searches using the Knowledge and Library Hub.

Sign up to NHS OpenAthens to access our subscriptions.

Contact us to receive our bulletins via email each month.

Get personalised alerts via our KnowledgeShare service.

ruh.nhs.uk/library

New training via MS Teams available from the Academy Library:

- **Bitesize searching databases for evidence: a quick guide to help you develop your literature searching skills**
  45 minutes. Learn how to transform a question into a search strategy, and how to find the best evidence in a database.

  Next sessions: 10th November @ 11am & 2nd December @ 12 noon

- **Simple and painless evidence into practice (BMJ Best Practice and the LKS Hub)**
  30 minutes. Learn about quick and hassle-free ways to seamlessly incorporate evidence into your daily work.

  Next sessions: 11th November @ 10am & 3rd December @ 11am

- **Quickfire health literacy: communicating with patients more effectively**
  30 minutes. Learn about the communication barriers patients may encounter, and ways to ensure they get the most from their care.

  Next sessions: 28th November @ 12 noon & 9th December @ 1pm

Book a session today at https://forms.office.com/e/HyiSXfDaYV (these sessions will be held on a monthly basis)

---

1. **Eustachian valve endocarditis in patients with Fournier's gangrene and septic shock: A rare case and a literature review.**

Authors: Ahmed Idris A.S.;Nashrah U.;Amara U.E. and Shaikh, N.

Publication Date: 2025

Journal: Qatar Medical Journal 2025(3) (pagination), pp. Article Number: 93. Date of Publication: 2025

Abstract: Introduction: The eustachian valve (EV) is a remnant of the right sinus venosus valve. It remains different in size and shape without much impact on adult life. In 5% to 10% of all endocarditis, are seen in the right side of the heart is involved, which is rare compared to the left side of the heart. Bacteremia, central venous catheter, heart implants, and drug abuse increase the risk of EV vegetation and right heart endocarditis. We are reporting a case of EV endocarditis in patients with Fournier's gangrene and septic shock. Case Presentation: A 45-year-old male patient was admitted into the surgical intensive care unit with Fournier's gangrene, septic shock, and acute kidney injury (AKI). The patient was managed by invasive ventilation, noradrenaline, vasopressin, and renal replacement therapy. He developed Escherichia coli bacteremia and candidemia. We added meropenem and antifungal to the therapy. The transthoracic echocardiography showed EV vegetation and thread-like vegetation in the right coronary sinus, which was confirmed with transesophageal echocardiography. With aggressive therapies, the patient recovered from septic shock, organ dysfunction and was successfully liberated from invasive ventilation. The patient was discharged home on day 27. The antibiotics and antifungal were continued for 6 weeks. Two weeks after discharge, the follow-up echocardiogram was normal, and he was doing well. Discussion(s): Eustachian valve endocarditis is rare, and should be treated with appropriate, culture-and sensitivity-guided antibiotics and or antifungal therapy for 6 weeks. The outcome of EV vegetations of endocarditis is good. The reported mortality is up to 17%. The independent risk factors associated with mortality are AKI, the Charlson comorbidity index, congestive heart failure, larger vegetation, and central nervous system involvement. Conclusion(s): The presence of larger EV, along with E. coli (ESBL) bacteremia and fungemia, increases the risk of right-sided endocarditis, which is rarely reported. Our patient was diagnosed early, received appropriate antimicrobial treatment for a sufficient duration, resulting in a better outcome. A

high index of suspicion, along with early diagnosis and culture-guided 6-week antimicrobial therapy, will improve the patient's outcomes.

---

2. **A Systematic Review and Meta-Analysis of Microrna as Predictive Biomarkers of Acute Kidney Injury**

Authors: Brown N., Roman M., Miller D., Murphy G. and Wozniak, M.J.

Publication Date: 2025

Publication Details: Heart. Conference: British Cardiovascular Society Annual Conference, BCS 2025. Manchester United Kingdom. 111(Supplement 3) (pp A244-A246); BMJ Publishing Group,

Abstract: Acute kidney injury (AKI) affects up to 15% of hospitalised patients and commonly arises following severe infections, major surgeries, or exposure to nephrotoxic agents. AKI diagnosis based on changes in serum creatinine levels lacks specificity and may delay diagnosis. MicroRNAs (miRNAs) are short, non-coding RNA oligonucleotides secreted by all cell types. This systematic review evaluated studies investigating miRNAs in AKI to assess their potential as diagnostic markers. Data were included from patients diagnosed with AKI related to sepsis, cardiopulmonary bypass surgery, nephrotoxins, ischemia, radiocontrast exposure, shock, and trauma. Seventy-one studies were included in the review, with the majority focused on sepsis-induced AKI, followed by AKI due to cardiac surgery, ICU admission, and exposure to nephrotoxic agents or ischemic conditions. Studies that employed untargeted assays identified 856 differentially expressed miRNAs, although none were validated across more than one study. Additionally, 68 studies used a targeted approach, measuring miRNAs by qRT-PCR, and reported downregulation of miR-495-3p and miR-370-3p in sepsisinduced AKI after diagnosis. Upregulation of miR-21 at the time of AKI diagnosis was reported in three studies, with a significant pooled effect size of 0.56. Whilst miR-21 levels were also measured 19-24 hours post-cardiac surgery in three studies, the pooled effect was not significant. Despite extensive research into miRNAs in AKI, a significant knowledge gap remains regarding their applicability as diagnostic biomarkers in human AKI.

---

3. **Acute kidney injury and morbi-mortality associated with "triple whammy" combination: Systematic review and meta-analysis.**

Authors: Calvo D.M.;Saiz L.C.;Leache L.;Celaya M.C. and GutierrezValencia, M.

Publication Date: 2025

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

Abstract: Aims: "Triple whammy" (TW) refers to the concomitant use of diuretics, renin-angiotensin-aldosterone system inhibitors (RAASI) and non-steroidal anti-inflammatory drugs (NSAIDs). The aim of this article is to analyse the association between TW exposure and acute kidney injury (AKI), among other morbi-mortality outcomes. Method(s): We included studies published up to August 2023 in the Cochrane Library, Medline or EMBASE, among others. The risk of AKI within 12 months after TW vs. not exposed to TW was the main outcome. Result(s): We included five case-control studies, involving 410 130 participants. The risk of AKI was significantly higher among those exposed to TW vs. not exposed (odds ratio [OR] 2.01, 95% confidence interval [CI] 1.30-3.10; four studies; I2: 90%; low certainty of evidence). Three studies provided data on all-cause mortality, not showing a significantly higher risk with TW exposure (very low certainty of evidence). Conclusion(s): The available evidence reveals that TW may lead to a significantly higher risk of AKI and related hospitalizations, with no detrimental effect on mortality.

---

4. **Acute kidney injury as a predictor of infectious complications after mini-PCNL.**

Authors: Cormio, Angelo;Castellani, Daniele;De Palma, Domenico;Fiorella, Ruggiero;Ratnayake, Runeel;Lotito, Michele;Albino, Giuseppe;Falagario, Ugo Giovanni;Busetto, Gian Maria;Bettocchi, Carlo;Carrieri, Giuseppe and Cormio, Luigi

Publication Date: Sep ,2025

Journal: BJUI Compass 6(9), pp. e70084

Abstract: Objective: To investigate the incidence, risk factors and clinical consequences of acute kidney injury (AKI) following mini-percutaneous nephrolithotomy (mini-PCNL), with particular focus on its association with postoperative infectious complications. Materials and Methods: A retrospective analysis was conducted on 496 adult patients who underwent mini-PCNL (22 Ch) between February 2020 and April 2025. AKI was defined according to KDIGO criteria as either a >= 1.5-fold increase or an absolute increase of >=0.3 mg/dl in serum creatinine within 72 hours postoperatively. Patients were stratified into AKI and non-AKI groups. Multivariable logistic regression analyses were performed to identify predictors of AKI development and infectious complications. Results: Surgery was done in spinal anaesthesia in all cases. AKI occurred in 45 patients (9.1%). There was no difference in median surgical time (52.5 vs 55.0 minutes, p = 0.33) between groups. There was no difference between the two groups in gender distribution, median age, body mass index, baseline serum creatinine, rates of comorbidities and stone features. Patients with AKI had significantly higher rates of overall postoperative complications (24.4% vs 7.1%, p : Surgery was done in spinal anaesthesia in all cases. AKI occurred in 45 patients (9.1%). There was no difference in median surgical time (52.5 vs 55.0 minutes, p = 0.33) between groups. There was no difference between the two groups in gender distribution, median age, body mass index, baseline serum creatinine, rates of comorbidities and stone features. Patients with AKI had significantly higher rates of overall postoperative complications (24.4% vs 7.1%, p : Surgery was done in spinal anaesthesia in all cases. AKI occurred in 45 patients (9.1%). There was no difference in median surgical time (52.5 vs 55.0 minutes, p = 0.33) between groups. There was no difference between the two groups in gender distribution, median age, body mass index, baseline serum creatinine, rates of comorbidities and stone features. Patients with AKI had significantly higher rates of overall postoperative complications (24.4% vs 7.1%, p : Surgery was done in spinal anaesthesia in all cases. AKI occurred in 45 patients (9.1%). There was no difference in median surgical time (52.5 vs 55.0 minutes, p = 0.33) between groups. There was no difference between the two groups in gender distribution, median age, body mass index, baseline serum creatinine, rates of comorbidities and stone features. Patients with AKI had significantly higher rates of overall postoperative complications (24.4% vs 7.1%, p Conclusions: The strong association between AKI and infectious complications, including potential mortality from sepsis, highlights the clinical significance of this underreported complication. Enhanced perioperative monitoring and aggressive management of infectious complications are warranted in patients who develop AKI following mini-PCNL. Copyright © 2025 The Author(s). BJUI Compass published by John Wiley & Sons Ltd on behalf of BJU International Company.

---

5. **Machine learning model for early prediction of acute kidney injury in heatstroke patients based on the first 24 h hospitalization data.**

Authors: Ding, Xiaonan;Wang, Min;Wang, Lu;Li, Yun;Yan, Lei;Li, Lu;Niu, Yue;Du, Junxia;Duan, Yingjie;Chen, Fei;Song, Chenwen;Kang, Hongjun and Zhu, Hanyu

Publication Date: Sep 26 ,2025

Journal: Scientific Reports 15(1), pp. 33085

Abstract: With the increasing frequency and intensity of heatwaves driven by climate change, heatstroke has emerged as a growing public health concern. As the most severe form of heat-related illness, heatstroke is frequently complicated by acute kidney injury (AKI), a major contributor to poor prognosis. Although AKI often develops in later stages, early detection is essential to reduce morbidity and mortality. This study aimed to develop and validate machine learning models to predict AKI using

clinical data from the first 24 h of hospitalization, enabling timely intervention and improved outcomes. We retrospectively collected data from 290 heatstroke patients admitted to 55 hospitals in China between 2008 and 2024. Variables included demographics, clinical features, comorbidities, vital signs, laboratory results, treatments, and complications. Data from the first 24 h of hospitalization were analyzed using univariate analysis, ROC curves, and collinearity testing to identify key predictors. These variables were used to build logistic regression and five machine learning models (Naive Bayes, decision tree, kNN, SVM, and XGBoost), with 20-fold cross-validation applied to reduce overfitting. The cohort was predominantly male (90.69%) with a median age of 25 [21, 41] years, and AKI occurred in 57.93% of patients. Within the first 24 h of hospitalization, the AKI group showed significantly higher core temperatures and heart rates compared to the non-AKI group. They also exhibited elevated renal function markers, coagulation and inflammatory indicators, as well as more pronounced liver dysfunction and rhabdomyolysis. Logistic regression and five machine learning algorithms were applied to predict AKI occurrence using early clinical data. Among them, the kNN model achieved the best performance (AUC = 0.934 [0.909, 0.959]), with troponin T (TnT), D-dimer, myoglobin (Mb), and hematocrit (HCT), identified as key predictive features. Based on clinical data from the first 24 h of hospitalization, the kNN model demonstrated the highest predictive performance for identifying heatstroke patients at risk of a rapid rise in serum creatinine or oliguria during hospitalization. TnT, D-dimer, Mb, and HCT were identified as key predictive variables.

---

6. **Under the Radar: Back Pain and Acute Kidney Injury as Harbingers of Type A Aortic Dissection.**

Authors: Gelan, Yohannes Debebe;Ntow, Mark;Sule-Saa, Samuel and Adedayo, Ajibola

Publication Date: Aug ,2025

Journal: Cureus 17(8), pp. e90584

Abstract: Aortic dissection is a catastrophic vascular emergency with a high mortality rate if not diagnosed and managed in a timely manner. The classic presentation of thoracic aortic dissection includes the sudden onset of severe chest pain radiating to the back. Still, it may also present with atypical symptoms and signs of end-organ vascular compromise. We present a case of a 57-year-old female with a medical history of hypertension with poor medication adherence, major depressive disorder, chronic low back pain, and cocaine use disorder, who initially presented to the ED with worsening chronic low back pain, which was attributed to a musculoskeletal origin. She received analgesics, which improved the pain. Approximately 7 hours after presentation, the following morning, the patient developed acute-onset chest pain, prompting repeat evaluation, including an electrocardiogram and cardiac biomarkers, which revealed T-wave inversion in the lateral leads and elevated troponin levels. Based on these findings, the non-ST elevation myocardial infarction (NSTEMI) protocol was initiated. While the back pain and chest pain improved, her kidney function continued to rapidly deteriorate from the time of admission, prompting the team to perform a sonogram and subsequently an abdominal CT, which revealed a heterogeneous, hyperechoic right kidney with loss of corticomedullary distinction and possible aortic pathology. A CT angiogram of the chest, abdomen, and pelvis confirmed a type A aortic dissection extending from the aortic root to the iliac bifurcation. The dissection caused significant narrowing at the origin of the left common carotid artery and partial infarction of the right kidney due to involvement of the renal artery. The patient was transferred to a tertiary hospital for surgical intervention and remained hemodynamically stable; however, she opted against surgical intervention and left against medical advice despite extensive counseling. Clinicians should maintain a high index of suspicion for aortic dissection in patients with unexplained back pain, particularly when there are signs of multiorgan ischemia.

---

7. **Risk factors associated with the development of complications after a hip fracture.**

Authors: Goh E.L.;Png M.E.;Metcalfe D.;Achten J.;Appelbe D.;Griffin X.L.;Cook J.A. and Costa, M. L.

Publication Date: 2025

Journal: Bone and Joint Journal 107B(9) (pp 950-956), pp. Date of Publication: 01 Se 2025

Abstract: Aims Mortality after a hip fracture has declined in recent years, but the risk of complications remains high. The aim of this study was to identify non-modifiable and, specifically, modifiable factors associated with the development of complications after hip fracture. Methods This was a multicentre, prospective cohort study of adults aged >= 60 years with a hip fracture who were treated in 77 hospitals in England, Wales, and Northern Ireland between July 2014 and November 2021. A total of 24,523 patients were enrolled into the study. Cox proportional hazards regression models were used to assess associations between prespecified (a priori) covariates and the development of surgery-specific and general complications at 120 days, postoperatively. Results For surgery-specific complications, male sex was associated with reoperation (hazard ratio (HR) 1.23 (95% CI 1.01 to 1.51)) and surgical site infection (SSI) (HR 1.20 (95% CI 1.00 to 1.43)); American Society of Anesthesiologists (ASA) grade >= III with prosthetic dislocation (HR 2.19 (95% CI 1.40 to 3.41)), reoperation (HR 1.35 (95% CI 1.06 to 1.72)), and surgical site infection (SSI) (HR 1.26 (95% CI 1.02 to 1.56)); treatment with a cephalomedullary nail with periprosthetic or peri-implant fracture (HR 4.09 (95% CI 1.62 to 10.32)) and reoperation (HR 1.94 (95% CI 1.29 to 2.92)); and treatment with total hip arthroplasty (THA) with prosthetic dislocation (HR 2.43 (95% CI 1.54 to 3.82)). For general complications, age was associated with acute kidney injury (AKI) (HR 1.04 (95% CI 1.03 to 1.05)), the requirement of a blood transfusion (HR 1.02 (95% CI 1.01 to 1.02)), lower respiratory tract infection (LRTI) (HR 1.02 (95% CI 1.01 to 1.03)), and urinary tract infection (UTI) (HR 1.02 (95% CI 1.01 to 1.02)); ASA grade >= III with AKI (HR 1.52 (95% CI 1.18 to 1.95)), the requirement of a blood transfusion (HR 1.35 (95% CI 1.16 to 1.58)), LRTI (HR 2.02 (95% CI 1.72 to 2.37)), and UTI (HR 1.33 (95% CI 1.13 to 1.56)); male sex with AKI (HR 1.30 (95% CI 1.09 to 1.55)) and LRTI (HR 1.33 (95% CI 1.20 to 1.48)); delayed mobilization with AKI (HR 1.68 (95% CI 1.13 to 2.44)), LRTI (HR 1.96 (95% CI 1.75 to 2.19)), UTI (HR 1.52 (95% CI 1.32 to 1.74)), myocardial infarction (MI) (HR 2.05 (95% CI 1.35 to 3.10)), and pulmonary embolism (HR 1.70 (95% CI 1.05 to 2.74)); and delayed surgery with MI (HR 1.66 (95% CI 1.13 to 2.44)). Conclusion Patient-related factors such as increasing age, male sex, and higher comorbidity were associated with a number of complications, which may explain the higher mortality and worse recovery seen in these groups. We also identified a number of potentially modifiable treatment-related factors which may influence the development of complications and which warrant further investigation.

---

8. **Health inequalities and outcomes following acute kidney injury: a systematic review & meta-analyses of observational studies.**

Authors: Grant C.H.;Dahiya A.;Palechuk T.;Lambourg E.;Tan B.;Mehta R.L.;Pannu N. and Bell, S.

Publication Date: 2025

Journal: BMC Nephrology 26(1) (pagination), pp. Article Number: 494. Date of Publication: 01 Dec 2025

Abstract: Background: Inequalities in health describe the uneven distribution of health outcomes that result from genetic or environmental factors. The extent to which inequalities impact on outcomes from AKI is uncertain. The aim of this systematic review and meta-analysis was to determine the impact of health inequalities on AKI outcomes. Method(s): This review has been registered on PROSPERO (CRD42023422307). We included observational studies of adults who experienced at least one episode of AKI that reported outcomes stratified by sex/gender, race/ethnicity, deprivation, income, education, employment, housing, smoking, mental health conditions, geography or insurance status. The primary outcome was all-cause mortality and secondary outcomes were: progression to acute kidney disease; incident CKD; progressive CKD; AKI recovery; cardiovascular events; hospitalisations; ICU admission and hospital length of stay. The search was conducted in MEDLINE, Embase and Web of Science from inception to 10th January 2024. Study selection, extraction and risk of bias (Newcastle-Ottawa) were performed independently and studies meta-analysed where possible. Result(s): 7,312 titles/abstracts were screened, and 36 studies included (n=2,038,441). Few included data from lower-middle income countries (n=3). Evidence predominantly related to sex/gender (n=25), race/ethnicity

(n=14) and deprivation (n=11). On pooling relevant studies, no sex/gender-specific differences in all-cause mortality or AKI recovery were seen. Of twelve studies reporting mortality by race/ethnicity, six found no variation by racial/ethnic group. Six of nine studies reporting mortality by socioeconomic status found deprivation was an independent predictor of death. Few studies assessed the impact of mental health (n=3), insurance (n=1), housing (n=2), geography (n=1) and smoking status (n=3) and no reports quantified the impact of income, education, employment or substance use. Conclusion(s): This systematic review highlights a lack of evidence related to inequalities and AKI. Further studies are required to address these gaps and achieve progress towards equitable kidney health. Clinical trial number: Not applicable.

---

9. **Effect of acute kidney injury care bundles on patient prognosis: a systematic review and meta-analysis.**

Authors: Huang, Ying;Guan, Lingling and Sun, Chao

Publication Date: Sep 26 ,2025

Journal: BMC Nephrology 26(1), pp. 519

Abstract: BACKGROUND: Acute kidney injury (AKI) is a severe complication among hospitalized patients. This study aimed to investigate the effect of care bundles on the prognosis of AKI patients. METHODS: Electronic databases were searched from January 2012 to December 2023. Randomized controlled trials and cohort studies evaluating the effect of AKI care bundles were included. A meta-analysis using a random-effects model was conducted to explore the efficacy of the AKI care bundle. RESULTS: A total of 12 studies with 30,152 participants were included. Based on the random-effects model, the AKI care bundles significantly improved the AKI severity (RR: 0.77, 95% CI: 0.60-0.98, I2 = 64%) and the need for renal replacement therapy (RR: 0.66, 95% CI: 0.46-0.94, I2 = 14%). However, our study did not find a statistically significant impact of AKI care bundle on the incidence of AKI incidence (RR: 0.95, 95% CI: 0.81-1.13, I2 = 87%), major adverse kidney events (RR: 1.06, 95% CI: 0.65-1.73), in-hospital mortality (RR: 0.93, 95% CI: 0.81-1.07, I2 = 19%), and length of hospital stay (MD: -0.16, 95% CI: -0.80, 0.47). CONCLUSION: This systematic review indicates that the implementation of the AKI bundle is a promising care model for AKI patients. There is a need for more high-quality prospective studies on AKI and patients at high risk of AKI to further determine feasible and standardized models of AKI bundle care. CLINICAL TRIAL NUMBER: Not applicable. Copyright © 2025. The Author(s).

---

10. **Cardiovascular and Renal Outcomes Following Acute Kidney Injury in Pregnancy: A Systematic Review and Meta-Analysis.**

Authors: Jeyaraman D.;Peiris D.P.;Lambie M.;Bramham K.;Fish R.;Alahmdi H.;Mamas M.A. and Wu, P.

Publication Date: 2025

Journal: BJOG: An International Journal of Obstetrics and Gynaecology (pagination), pp. Date of Publication: 2025

Abstract: Background: Acute kidney injury (AKI) in pregnancy is associated with adverse maternal and foetal outcomes. However, there is limited evidence regarding cardiac and renal outcomes associated with AKI in pregnancy. Objective(s): To quantify and perform a meta-analysis of the risk of adverse cardiovascular and renal outcomes following AKI in pregnancy. Search Strategy: A systematic search of MEDLINE, Cochrane Library and EMBASE from inception until 23 January 2024. Selection Criteria: Studies investigating adverse cardiovascular and renal outcomes in pregnant patients with AKI. Data Collection and Analysis: Two reviewers independently performed screening, data extraction and quality assessment. A random-effects model was used to estimate risk. Main Result(s): A total of 17 studies were included with 50 285 836 pregnant women, of which 36 806 women were affected by AKI. Our evidence synthesis showed that AKI in pregnancy is associated with a 52-fold increase in the risk of

composite adverse renal outcomes (OR 52.37; 95% CI 4.67-587.63), a 23-fold increase in the risk of heart failure (OR 22.55; 95% CI 4.39-115.71) and stroke (OR 22.92; 95% CI 2.32-226.65), as well as a 9.3-fold and 3.9-fold increased risk of maternal mortality (OR 9.26; 95% CI 2.53-33.96) and intensive care unit admission (OR 3.86; 95% CI 1.93-7.71), respectively. Conclusion(s): The study shows that AKI in pregnancy is associated with adverse cardiovascular and renal outcomes. Careful monitoring and follow-up of patients with AKI in pregnancy may enable earlier detection and management of some adverse cardiovascular and renal outcomes.

---

11. **Beyond creatinine: diagnostic accuracy of emerging biomarkers for AKI in the ICU-a systematic review.**

Authors: Matarneh A.;Akkari A.;Sardar S.;Salameh O.;Dauleh M.;Matarneh B.;Abdulbasit M.;Miller R.;Verma N. and Ghahramani, N.

Publication Date: 2025

Journal: Renal Failure 47(1) (pagination), pp. Article Number: 2556295. Date of Publication: 2025

Abstract: Background: Acute kidney injury (AKI) affects 30-50% of critically ill patients and is associated with increased mortality, longer ICU stays, and chronic kidney dysfunction. Current diagnostic markers, serum creatinine and urine output are delayed and often insensitive. Novel biomarkers such as neutrophil gelatinase-associated lipocalin (NGAL), kidney injury molecule-1 (KIM-1), and the combined urinary assay of tissue inhibitor of metalloproteinases-2 and insulin-like growth factor-binding protein 7 (TIMP-2.IGFBP7) have emerged as promising tools for early AKI detection. Objective(s): To systematically evaluate the diagnostic accuracy of NGAL, KIM-1, and TIMP-2.IGFBP7 in predicting AKI in critically ill adults. Method(s): A systematic search of PubMed, Embase, and Cochrane Library was conducted for studies from January 2015 to April 2025. Eligible studies assessed the diagnostic accuracy of NGAL, KIM-1, or TIMP-2.IGFBP7 in adult ICU patients and reported sensitivity, specificity, or AUC. Methodological quality was appraised using QUADAS-2. PROSPERO registration: CRD420251038322. Result(s): Thirty-five studies were included: 13 assessed NGAL, 7 KIM-1, and 15 TIMP-2.IGFBP7. NGAL showed sensitivity of 65-89% and specificity of 60-85% (AUC: 0.70-0.91). KIM-1 showed moderate performance (AUC: 0.64-0.80). TIMP-2.IGFBP7, especially with higher cutoffs, demonstrated high specificity but variable sensitivity. Differences in assay thresholds, timing, and AKI definitions contributed to heterogeneity. Conclusion(s): NGAL and TIMP-2.IGFBP7 show the most consistent performance for early AKI detection in ICU settings. Standardized multicenter studies are needed to confirm clinical utility and support integration into AKI diagnostic workflows.

---

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

Authors: O'Dell Duplechin, Mary;Folds, Garrett T.;Duplechin, Drake P.;Ahmadzadeh, Shahab;Myers, Sarah H.;Shekoohi, Sahar and Kaye, Alan D.

Publication Date: Sep 05 ,2025

Journal: Diseases 13(9)

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.

---

13. **The Effect of Sodium-Glucose Co-Transporter-2 Inhibitors in Contrast-Induced Acute Kidney Injury: A Systematic Review and Meta-Analysis.**

Authors: Rafsanjani M.R.H.;Rezvanfar K.;Saghafi D.;Sabbaghi S.;Parastooei B. and Darvishi, M.

Publication Date: 2025

Journal: International Tinnitus Journal 28(S1) (pp 100-107), pp. Date of Publication: 2025

Abstract: Background and Aims: Contrast-Induced Acute Kidney Injury (CI-AKI) is the third leading cause of hospital-acquired renal damage, associated with increased mortality and morbidity. Despite CI-AKI incidence decline, it remains a concern, especially during procedures like percutaneous coronary intervention, impacting the vulnerable elderly with compromised renal function. This study aimed at assessing the effect of Sodium-Glucose Transporter-2 Inhibitors in contrasting induced nephropathy. Methods and Materials: Authors performed a systematic search of literature in Web of Science, Scopus, and PubMed with relevant keywords. Our eligibility criteria were defined based on the PICO framework. The pooled odds ratios were calculated using random effects model and Mantel-Haenszel method along with the 95% confidence intervals. For assessing the heterogeneity of the included studies, the I2 (I square) test was used. R and RStudio were used for the statistical analysis. Result(s): Overall, from 20 records, 5 studies were added for final analysis. Based on the pooled OR of the included studies, there was no significant association between exposure to SGLT2-type drugs and CI-AKI compared to the control groups [OR=0.86, 95%CI: 0.29 - 2.51, p-value = 0.78]. Based on the pooled mean eGFR of the included studies, there was a significant association between exposure to SGLT2-type drugs and lower levels of eGFR compared to the control groups [MD=-4.00, 95%CI:-7.75 - -0.24, p-value = 0.04]. Conclusion(s): In conclusion, we assessed the impact of Sodium-Glucose Co-Transporter 2 Inhibitors (SGLT2i) on Contrast-Induced Acute Kidney Injury (CI-AKI). No significant association between SGLT2i use and CI-AKI risk was found, but a notable link emerged between SGLT2-type drug exposure and lower Estimated Glomerular Filtration Rate (eGFR). Uncertainty persists on whether SGLT2i prevent or contribute to CI-AKI, with a suggestion to temporarily halt SGLT2i before contrast studies, particularly in certain patients.

---

14. **Community-Acquired Acute Kidney Injury and Late Kidney Dysfunction in Survivors of COVID-19 Hospitalization.**

Authors: Ribeiro, Heitor S.;Frediani, Marcella M.;Marcal, Lia;Antonangelo, Leila;Catharina, Guilherme S.;Yu, Luis;Zanetta, Dirce M. T.;Mauad, Thais;Moreira, Tiana C. L.;Gouveia, Nelson;Busatto, Geraldo F.;Carvalho, Carlos R. R. and Burdmann, Emmanuel A.

Publication Date: Sep ,2025

Journal: KI Reports 10(9), pp. 3032–3043

Abstract: Introduction: Data on the incidence and risk factors for renal long COVID are scarce. We aimed to investigate 2 acute kidney injury (AKI) phenotypes, namely community-acquired (CA; CA-AKI) and hospital-acquired (HA; HA-AKI), and the development of late kidney dysfunction in survivors of COVID-19 hospitalization. Methods: This is a prospective cohort study of survivors of moderate-to-severe COVID-19 hospitalization in Brazil, from March to August 2020. The patients were assessed for up to 11 months after hospital discharge. Exposure was CA-AKI and HA-AKI. The main outcome was kidney dysfunction defined as incident low estimated glomerular filtration rate (eGFR; : This is a prospective cohort study of survivors of moderate-to-severe COVID-19 hospitalization in Brazil, from March to August 2020. The patients were assessed for up to 11 months after hospital discharge. Exposure was CA-AKI and HA-AKI. The main outcome was kidney dysfunction defined as incident low estimated glomerular filtration rate (eGFR; 2) and/or eGFR decline >= 25% from discharge at follow-up. An adjusted binary logistic regression analysis was run. Results: A total of 655 survivors were evaluated (6.5 +/- 1.9 follow-up months); 79% had AKI (35% CA and 43% HA); 14% used kidney replacement therapy (KRT). Late kidney dysfunction occurred in 28% of the patients (16% with incident low eGFR and 27% with eGFR decline >= 25%). CA-AKI, but not HA-AKI, was independently associated with late kidney dysfunction (adjusted odds ratio [aOR] = 7.3, 95% confidence interval (CI): 3.6-15.8 and aOR = 2.2, 95% CI: 0.9-4.8, respectively). Conclusion: In conclusion, late kidney dysfunction affected 1 in 4 COVID-19 survivors. CA-AKI, but not HA-AKI, was an independent risk factor for late kidney dysfunction. These findings suggest that renal long COVID might be frequent and that a specific AKI phenotype (CA-AKI) may play a crucial role in its development. Our research highlights the need for CA-AKI prevention and for the long-term follow-up and care of patients affected by this AKI phenotype during COVID-19 infection.

---

15. **Statin use and acute kidney injury among hospitalized chronic kidney disease patients: a retrospective cohort study.**

Authors: Tang L.E.;Xu D.M.;Xu L.Y.;Zhao Y.L.;Zhu Y.D.;Lv J.C.;Yang L. and Zheng, X. Z.

Publication Date: 2025

Journal: Frontiers in Medicine 12(pagination), pp. Article Number: 1639130. Date of Publication: 2025

Abstract: Background: Chronic kidney disease (CKD) constitutes a substantial burden in terms of cardiovascular disease and acute kidney injury (AKI). While statins are recommended for their cardiovascular benefits in CKD patients, their impact on AKI remains inconclusive. Method(s): A retrospective screening was conducted on all adult hospital admissions from January 1, 2018, to December 31, 2020, including patients with CKD. Statin exposure was defined as any prescription within 48 h of admission. Patients were monitored until death, discharge, or a maximum of 30 days. The primary outcome was in-hospital AKI, with in-hospital mortality as the secondary outcome. Result(s): In a cohort of 5,376 patients, the median age was 72 years; 3,184 (59.2%) were male, and 2,129 (39.6%) were statin users. In-hospital AKI was observed in 149 (7.0%) of statin users compared to 213 (6.6%) of non-users. Statin use was significantly associated with a reduced risk of in-hospital AKI [adjusted hazard ratio [aHR], 0.74; 95% confidence interval [CI], 0.56-0.96] and in-hospital mortality (aHR, 0.45; 95% CI, 0.24-0.88). These outcomes were consistent across subgroup analyses stratified by age, gender, baseline estimated glomerular filtration rate (eGFR), and cardiovascular disease (all P for interaction >0.05), as well as in sensitivity analyses excluding patients who discontinued statin therapy during hospitalization or initiated statin therapy post-baseline. Among atorvastatin users (63.4%, 1,350/2,129), only medium-dose atorvastatin was significantly associated with reduced risk of in-hospital AKI after full adjustment (aHR, 0.68; 95% CI, 0.49-0.95). Conclusion(s): Statin use may improve survival and reduced AKI risk in hospitalized patients with CKD, with atorvastatin showing particularly favorable renoprotective effects.

---

16. **Is Contrast-Enhanced Imaging in the Emergency Department a Risk Factor for Contrast-Associated Acute Kidney Injury?.**

Authors: Uge L.A.;Uzum Y.;Uge M. and Soypacaci, Z.

Publication Date: 2025

Journal: International Journal of General Medicine 18, pp. 5491–5501

Abstract: Purpose: We aimed to determine the predisposing factors for contrast-associated acute kidney injury (CA-AKI) among patients exposed to contrast media during emergency department visits and follow-ups in internal medicine, and to evaluate subsequent outcomes such as mortality and intensive care unit (ICU) admission. Patients and Methods: A total of 1483 patients who presented to the internal medicine clinic from the emergency department or outpatient clinic and underwent contrast-enhanced computed tomography (CT) were retrospectively analyzed. A total of 382 cases with kidney function tests available for the study before contrast exposure and at 24, 72, and 120 hours after exposure were included in the study. An increase in serum creatinine by 25% or more from the baseline or an absolute increase of 0.5 mg/dl (44.20 micromol/L) or more after one hour was considered as contrast nephropathy. Result(s): Contrast-associated acute kidney injury was observed in 17% of the study population, with the majority of cases emerging within the initial 24-hour period following contrast exposure. In 54% of these patients, contrast media had been administered in the internal medicine department. Among them, 13.9% subsequently required admission to the intensive care unit (ICU). Furthermore, individuals with a history of hypertension were found to have a 2.31-fold increased risk of developing CA-AKI compared to those without hypertension. Conclusion(s): The likelihood of contrast-associated nephropathy appears to be markedly increased in hypertensive individuals undergoing contrast-enhanced CT in emergency departments. Prophylactic intravenous hydration has also been demonstrated to play a crucial role in reducing CA-AKI incidence.Copyright © 2025 Uge et al.

---

17. **Acute kidney injury after hip fracture surgery among elderly patients in the ICU: incidence, risk factors and their predictive value, clinical impact-a retrospective single-center study.**

Authors: Wang J.;Wang L.;Bai Y. and Wang, H.

Publication Date: 2025

Journal: Renal Failure 47(1) (pagination), pp. Article Number: 2560595. Date of Publication: 2025

Abstract: Objective: To explore the incidence, risk factors and clinical effects of acute kidney injury (AKI) in elderly patients with hip fracture admitted to the ICU postoperatively and assess the predictive value of risk factors. Method(s): We retrospectively analyzed consecutive elderly patients with hip fracture who underwent surgery and were admitted to the ICU at Beijing Jishuitan Hospital, Capital Medical University (October 2022-August 2023). Patients were divided into AKI group and non-AKI group according to whether AKI occurred. Demographic, preoperative, intraoperative, and postoperative data were compared. Multivariate logistic regression identified AKI risk factors, and receiver operating characteristic (ROC) curves evaluated their predictive ability. Result(s): Among 156 patients, 31 (19.9%) developed AKI. Multivariate logistic regression analysis showed that female sex, intraoperative blood transfusion, postoperative albumin level and postoperative Acute Physiology and Chronic Health Evaluation (APACHE) II score were independent risk factors for AKI (p Result(s): Among 156 patients, 31 (19.9%) developed AKI. Multivariate logistic regression analysis showed that female sex, intraoperative blood transfusion, postoperative albumin level and postoperative Acute Physiology and Chronic Health Evaluation (APACHE) II score were independent risk factors for AKI (p Result(s): Among 156 patients, 31 (19.9%) developed AKI. Multivariate logistic regression analysis showed that female sex, intraoperative blood transfusion, postoperative albumin level and postoperative Acute Physiology and Chronic Health Evaluation (APACHE) II score were independent risk factors for AKI (p Result(s): Among 156 patients, 31 (19.9%) developed AKI. Multivariate logistic regression analysis showed that female sex, intraoperative blood transfusion, postoperative albumin level and postoperative Acute Physiology and Chronic Health Evaluation (APACHE) II score were independent risk factors for AKI (p Conclusion(s): The incidence of AKI was high in elderly patients with

hip fracture admitted to ICU after surgery. The combination of being female, receipt of intraoperative blood transfusion, postoperative albumin level and postoperative APACHE II score had good predictive value for AKI. The occurrence of AKI resulted in prolonged ICU stay.Copyright © 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

---

18. **Renin-angiotensin aldosterone system inhibitors usage among hospitalized patients with acute kidney injury: a retrospective study.**

Authors: Xu L.;Zhou Q.;Tang L.;Xu D.;Yang L. and Zheng, X.

Publication Date: 2025

Journal: Annals of Medicine 57(1) (pagination), pp. Article Number: 2561231. Date of Publication: 2025

Abstract: Background: Although not recommended for potential risk of worsening kidney dysfunction, continuation of renin-angiotensin aldosterone system inhibitor (RAASi) during an episode of acute kidney injury (AKI) is not rare in clinical practice, and the risk-benefit ratio for RAASi therapy should always be carefully evaluated. Limited data exists regarding the reasons for RAASi continuation during the acute course of AKI and its impact on kidney and overall outcomes. Material(s) and Method(s): This retrospective study used electronic medical records from the clinical data warehouse of Peking University First Hospital to screen all adult admissions who developed AKI during hospitalization and were prescribed RAASi within 48 h prior to AKI onset between 1 January 2018 and 31 December 2020. Patients were further divided into RAASi discontinuers and continuers based on whether RAASi was withdrawn within 48 h after AKI onset. The primary outcome was non-recovery from AKI at discharge; the secondary outcomes were failure of full recovery from AKI and in-hospital mortality. Result(s): A total of 321 patients were prescribed RAASi within 48 h prior to AKI onset, of which RAASi therapy was continued in 196 (61.1%) cases (RAASi continuers). Under-recognition of AKI was considered the main reason for the continuation of RAASi (143 cases, 72.9%), followed by the exclusion of RAASi as the culprit drug (31 cases, 15.8%), strong indications for RAASi (20 cases, 10.2%) and transient AKI (18 cases, 6.6%). The non-recovery rates were 58.6% and 29.6% in RAASi continuers and discontinuers, respectively. After fully adjustment, RAASi continuation was associated with an increased risk of non-recovery (RR, 1.727; 95% CI 1.179, 2.588) and failure of full recovery from AKI (RR, 1.427; 95% CI 1.062, 1.938) at discharge. A non-significant association was observed between RAASi continuation and in-hospital mortality in both unadjusted and adjusted model. Conclusion(s): Under-recognition of AKI was predominant and might be the main reason for continuing RAASi after AKI onset. Continuation of RAASi during an AKI episode was associated with poor kidney recovery in the short term. Timely recognition of AKI should be improved, and a dynamic risk-benefit ratio evaluation for RAASi is required to achieve optimal management.Copyright © 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

---

19. **Incidence and risk factors of acute kidney injury in patients with polypharmacy: a systematic review and meta-analysis.**

Authors: Yang F.;Zhu L.;Cao B.;Miao H.;Zeng L.;Yuan Z.;Tian Y. and Li, Y.

Publication Date: 2025

Journal: International Journal of Clinical Pharmacy (pagination), pp. Date of Publication: 2025

Abstract: Introduction: Polypharmacy, typically defined as the use of five or more medications, has become increasingly common among older adults due to the rising prevalence of multimorbidity. While polypharmacy can be clinically necessary, it poses substantial risks for adverse drug events, including acute kidney injury (AKI). Drug-induced AKI accounts for a significant proportion of hospital-acquired cases and can result in prolonged hospitalization, increased healthcare costs, and higher mortality. Despite growing concern over these risks, the incidence of AKI associated with polypharmacy and the specific clinical and pharmacological factors contributing to this risk remain poorly quantified across

different populations and setting. Aim(s): To estimate the incidence of AKI among adults exposed to polypharmacy and identify key drug-related and clinical risk factors. Method(s): A systematic review and meta-analysis were conducted and reported following PRISMA guidelines. We searched eight international and Chinese databases from inception to April 2025 for observational studies involving adults (>= 18 years) receiving polypharmacy that reported AKI incidence or related risk factors. Eligible studies were assessed using the Newcastle-Ottawa Scale. Random-effects meta-analysis was used to calculate pooled AKI incidence. A narrative synthesis summarized the definitions of polypharmacy and identified associated risk factors. Result(s): Ten studies comprising over 302,000 participants were included; six studies provided data suitable for meta-analysis. The pooled incidence of AKI among patients exposed to polypharmacy was 18% (95% CI 2%, 45%). Key risk factors included high medication burden (>= 5 or >= 10 medications), cardiovascular drug combinations, use of nephrotoxic agents, pre-existing renal impairment, frailty, and exposure to intensive care. Definitions of polypharmacy varied substantially across studies, including count-based thresholds, class-specific definitions, and risk-based exposure models. Conclusion(s): Polypharmacy is significantly associated with an increased incidence of AKI, particularly among hospitalized and clinically vulnerable individuals. The lack of standardized definitions for polypharmacy complicates evidence synthesis and cross-study comparisons. Standardized terminology and risk-adjusted prescribing practices are essential to improve medication safety and renal outcomes in at-risk populations.

---

20. **Prediction of all-cause in-hospital mortality after ICU admission and 1-year mortality after discharge of patients with acute kidney injury.**

Authors: Zhong, Lei;Han, Li-Ying;Wu, Yan-Fang;Huang, Hui-Yan and Wang, Zhuo-Yan

Publication Date: Dec ,2025

Journal: Renal Failure 47(1), pp. 2562445

Abstract: Acute kidney injury (AKI) is a common comorbidity for in-hospital patients. This study aimed to develop dual prediction models for in-hospital and 1-year post-discharge mortality in patients with AKI, with a focus on identifying novel immunological risk factors. 7,937 patients (1,567 in-hospital deaths; 6,370 discharged) were selected from the Medical Information Mart for Intensive Care (MIMIC-IV) database based on serum creatinine and urine output criteria. Forty-two features were selected using least absolute shrinkage and selection operator (LASSO) regression and were used to construct prediction models. eXtreme Gradient Boosting (XGBoost) showed the best performance for in-hospital mortality prediction (training area under the curve (AUC) = 0.833; test AUC = 0.755). Kaplan-Meier curve and log-rank test revealed significant differences in 1-year mortality rates between patients without AKI and patients with AKI stage greater than 2 and those patients who did not recover from AKI at discharge showing a higher 1-year mortality risk (Hazard Ratio (HR) = 1.2, 95% Confidence Interval (CI) = 1.1-1.2). Among the five independent risk factors associated with 1-year mortality identified using univariate Cox regression, two were immune-related cells: neutrophils (HR = 1.01, 95% CI: 1.00-1.01), and neutrophil-to-lymphocyte ratio (HR = 1.01, 95% CI: 1.00-1.02). In conclusion, XGBoost demonstrated the highest predictive performance for in-hospital mortality, with simplified acute physiology score II emerging as the most significant variable.

---

21. **Perioperative Acute Kidney Injury and Anesthesia: A Narrative Review.**

Authors: Cekmen N.;Uslu A. and Yazar, C.

Publication Date: 2024

Journal: Journal of Clinical Practice and Research 46(4), pp. 311–324

Abstract: Perioperative acute kidney injury (AKI) remains challenging for the anesthesiologist and surgeon. It is one of the most common, heterogeneous, and severe complications. Perioperative AKI is associated with increased morbidity, mortality, the need for renal replacement therapy (RRT),

prolonged hospital stays, and escalating costs and healthcare resource utilization. Concomitant comorbidities, age, size, type, timing, the urgency of surgery, improper fluid management, anemia, hyperglycemia, malnutrition, the use of blood and blood products, contrast dyes, diuretics, and exposure to nephrotoxins are the main factors in the development of AKI. The main factors involved in the pathogenesis of perioperative AKI are highly complex and include a combination of hypoperfusion, microcirculatory and endothelial dysfunction, inflammation, and tubular cell damage. The main aim of anesthesiologists should be to identify risk factors in the perioperative period and minimize the incidence of perioperative AKI through appropriate anesthesia management and the necessary protective and preventive strategies. The anesthesia management should include optimization of hemodynamics, adequate organ perfusion and oxygenation, suitable monitoring, correct fluid management, anesthesia, pain control, mechanical ventilation methods, glycemic control, avoiding nephrotoxic drugs, contrast dyes, and blood transfusions, and early RRT and nutritional support. New biomarkers should be used to detect, intervene, and treat AKI promptly. We review the recent literature on the value and importance of comprehensive preoperative evaluation, optimization of risk factors, perioperative monitoring, anesthesia and pain management, preventive methods, and treatment in patients with AKI.

Sources Used:

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

Disclaimer:

The results of your literature search are based on the request that you made, and consist of a list of references, some with abstracts. Royal United Hospital Bath Healthcare Library will endeavour to use the best, most appropriate and most recent sources available to it, but accepts no liability for the information retrieved, which is subject to the content and accuracy of databases, and the limitations of the search process. The library assumes no liability for the interpretation or application of these results, which are not intended to provide advice or recommendations on patient care.