

AKI

Current Awareness Bulletin

March 2021

A number of other bulletins are also available – please contact the Academy Library for further details

If you would like to receive these bulletins on a regular basis please contact the library.

If you would like any of the full references we will source them for you.

Contact us: **Academy Library 824897/98**

Email: **ruh-tr.library@nhs.net**

Title: A Global Accounting of Kidney Replacement Therapy.

Citation: American journal of kidney diseases : the official journal of the National Kidney Foundation; Mar 2021; vol. 77 (no. 3); p. 309-311

Author(s): Shah, Maulin K; Winkelmayr, Wolfgang C

Title: A randomized controlled trial of comparative effectiveness between the 2 dose and 3 dose regimens of hepatitis a vaccine in kidney transplant recipients

Citation: Scientific Reports; Dec 2021; vol. 11 (no. 1)

Author(s): Prasoppokakorn T.; Chaiteerakij R.; Vanichanan J.; Jutivorakool K.; Udomkarnjananun S.; Wattanatorn S.; Avihingsanon Y.; Tungsanga K.; Eiam-Ong S.; Praditpornsilpa K.; Townamchai N.; Taesombat W.; Pongpirul K.

Abstract: Hepatitis A virus (HAV) is able to cause a spectrum of illnesses ranging from no symptom to fulminant hepatitis which may lead to acute kidney injury. Although hepatitis A vaccine is recommended in non-immune solid organ transplant recipients who live in or travel to endemic areas, the standard 2-dose vaccination regimen demonstrated less favorable immunogenicity among these population. The 3-dose regimen showed higher response rate and immune durability in patients with human immunodeficiency virus. However, this strategy has never been studied in solid organ transplant recipients. A single-center, open-labeled, computer-based randomized controlled trial (RCT) with a 2:1 allocation ratio was conducted from August 2017 to December 2018. The study compared the seroconversion rate after receiving 2- or 3-dose regimen of hepatitis A vaccine at 0, 6 and 0, 1, 6 months, respectively, in non-immune kidney transplant recipients. A total of 401 adult kidney transplant recipients were screened for anti-HAV IgG and 285 subjects had positive results so the seroprevalence was 71.1%. Of 116 seronegative recipients, 93 (80.2%) completed vaccination; 60 and 33 participants completed 2- and 3-dose vaccination, respectively. The baseline characteristics were comparable between both groups. The seroconversion rate at 1 month after vaccination was 51.7% in the standard 2-dose regimen and 48.5% in the 3-dose regimen ($p = 0.769$). Overall, the seroconversion rate appeared to be associated with high estimated glomerular infiltration rate, high serum albumin, and low intensity immunosuppressive regimen. Seroconversion rate after hepatitis A vaccination in kidney transplant recipients was less favorable than healthy population. Three-dose regimen did not show superior benefit over the standard 2-dose regimen. Other strategies of immunization may increase immunogenicity among kidney transplant recipients.

Title: Acute kidney injury after in-hospital cardiac arrest

Citation: Resuscitation; Mar 2021; vol. 160 ; p. 49-58

Author(s): Mah K.E.; Alten J.A.; Cornell T.T.; Selewski D.T.; Askenazi D.; Fitzgerald J.C.; Topjian A.; Page K.; Holubkov R.; Dean J.M.; Slomine B.S.; Christensen J.R.; Moler F.W.

Objective: Determine 1) frequency and risk factors for acute kidney injury (AKI) after in-hospital cardiac arrest (IHCA) in the Therapeutic Hypothermia after Pediatric Cardiac Arrest In-Hospital (THAPCA-IH) trial and associated outcomes; 2) impact of temperature management on post-IHCA AKI.

Method(s): Secondary analysis of THAPCA-IH; a randomized controlled multi-national trial at 37 children's hospitals. Eligibility: Serum creatinine (Cr) within 24 h of randomization.

Outcome(s): Prevalence of severe AKI defined by Stage 2 or 3 Kidney Disease Improving Global Outcomes Cr criteria. 12-month survival with favorable neurobehavioral outcome. Analyses stratified by entire cohort and cardiac subgroup. Risk factors and outcomes compared among cohorts with and without severe AKI.

Result(s): Subject randomization: 159 to hypothermia, 154 to normothermia. Overall, 80% (249) developed AKI (any stage), and 66% (207) developed severe AKI. Cardiac patients (204, 65%) were more likely to develop severe AKI (72% vs 56%, $p = 0.006$). Preexisting cardiac or renal conditions, baseline lactate, vasoactive support, and systolic blood pressure were associated with severe AKI. Comparing hypothermia versus normothermia, there were no differences in severe AKI rate (63% vs 70%, $p = 0.23$), peak Cr, time to peak Cr, or freedom from mortality or severe AKI ($p = 0.14$). Severe AKI was associated with decreased hospital survival (48% vs 65%, $p = 0.006$) and decreased 12-month survival with favorable neurobehavioral outcome (30% vs 53%, $p < 0.001$).

Conclusion(s): Severe post-IHCA AKI occurred frequently especially in those with preexisting cardiac or renal conditions and peri-arrest hemodynamic instability. Severe AKI was associated with decreased survival with favorable neurobehavioral outcome. Hypothermia did not decrease incidence of severe AKI post-IHCA.

Title: Acute kidney injury associated with COVID-19-Cumulative evidence and rationale supporting against direct kidney injury (infection).

Citation: Nephrology (Carlton, Vic.); Mar 2021; vol. 26 (no. 3); p. 239-247

Author(s): Parmar, Malvinder S

Abstract: Acute kidney injury (AKI) is a common complication, affecting up to 37% of hospitalized patients with SARS-CoV-2 infection and is proportional to its severity and portends poor prognosis. Diverse mechanisms have been proposed and studies reported conflicting results. Moreover, renal tropism of SARS-CoV-2 does not equate to its renal pathogenicity. For a virus to be pathogenic, in addition to its affinity (tropism) for specific tissue(s), host cells must allow viral entry, and discuss the important role played by transmembrane protease, serine 2 (TMPRSS2) and coexpression of both ACE2 and TMPRSS2 in the same cells is important to cause damage. Lack of coexpression of ACE2 and TMPRSS2 in the same cells of the kidneys is the limiting factor of SARS-CoV-2 direct effects in the kidney. We present the rationale and cumulative evidence supporting that AKI is secondary to hemodynamic and immunologic effects of SARS-CoV-2 infection than the direct injury or infection.

Title: Acute kidney injury: prevention, detection, and management. Summary of updated NICE guidance for adults receiving iodine-based contrast media.

Citation: Clinical Radiology; Mar 2021; vol. 76 (no. 3); p. 193-199

Author(s): Barrett ; Khwaja, A.; Carmona, C.; Martinez, Y.; Nicholas, H.; Rogers, G.; Wierzbicki, A.S.; Lewington, A.J.P.

Abstract: The National Institute for Health and Care Excellence (NICE) has recently updated the guideline for Acute kidney injury: prevention, detection and management (NG148), providing new recommendations on preventing acute kidney injury (AKI) in adults receiving intravenous iodine-based contrast media. The association between intravenous iodinated contrast media and AKI is controversial, particularly with widespread use of iso-osmolar agents. Associations between contrast media administration and AKI are largely based on observational studies, with inherent heterogeneity in patient populations, definitions applied, and timing of laboratory investigations. In an attempt to mitigate risk, kidney protection has typically been employed using intravenous volume expansion and/or oral acetylcysteine. Such interventions are in widespread use, despite lacking high-quality evidence of benefit. In the non-emergency setting, glomerular filtration rate (GFR) measurements should be obtained within the preceding 3 months before offering intravenous iodine-based contrast media. In the acute setting, adults should also have their risk of AKI assessed before offering intravenous iodine-based contrast media; however, this

should not delay emergency imaging. Based on the evidence available from randomised controlled trials, the NICE committee recommends that oral hydration should be encouraged in adults at increased risk of AKI and that volume expansion with intravenous V fluids should only be considered for inpatients at particularly high risk.

Title: Assessment of Acute Kidney Injury and Longitudinal Kidney Function After Hospital Discharge Among Patients With and Without COVID-19.

Citation: JAMA network open; Mar 2021; vol. 4 (no. 3); p. e211095

Author(s): Nugent, James; Aklilu, Abinet; Yamamoto, Yu; Simonov, Michael; Li, Fan; Biswas, Aditya; Ghazi, Lama; Greenberg, Jason; Mansour, Sherry; Moledina, Dennis; Wilson, F Perry

Objective: Importance Acute kidney injury (AKI) occurs in up to half of patients hospitalized with coronavirus disease 2019 (COVID-19). The longitudinal effects of COVID-19-associated AKI on kidney function remain unknown. This study aims to compare the rate of change in estimated glomerular filtration rate (eGFR) after hospital discharge between patients with and without COVID-19 who experienced in-hospital AKI.

Design, Setting, and Participants: A retrospective cohort study was conducted at 5 hospitals in Connecticut and Rhode Island from March 10 to August 31, 2020. Patients who were tested for COVID-19 and developed AKI were screened, and those who survived past discharge, did not require dialysis within 3 days of discharge, and had at least 1 outpatient creatinine level measurement following discharge were included.

Exposures: Diagnosis of COVID-19.

Main Outcomes and Measures: Mixed-effects models were used to assess the association between COVID-19-associated AKI and eGFR slope after discharge. The secondary outcome was the time to AKI recovery for the subgroup of patients whose kidney function had not returned to the baseline level by discharge.

Results: A total of 182 patients with COVID-19-associated AKI and 1430 patients with AKI not associated with COVID-19 were included. The population included 813 women (50.4%); median age was 69.7 years (interquartile range, 58.9-78.9 years). Patients with COVID-19-associated AKI were more likely to be Black (73 [40.1%] vs 225 [15.7%]) or Hispanic (40 [22%] vs 126 [8.8%]) and had fewer comorbidities than those without COVID-19 but similar rates of preexisting chronic kidney disease and hypertension. Patients with COVID-19-associated AKI had a greater decrease in eGFR in the unadjusted model (-11.3; 95% CI, -22.1 to -0.4 mL/min/1.73 m²/y; P = .04) and after adjusting for baseline comorbidities (-12.4; 95% CI, -23.7 to -1.2 mL/min/1.73 m²/y; P = .03). In the fully adjusted model controlling for comorbidities, peak creatinine level, and in-hospital dialysis requirement, the eGFR slope difference persisted (-14.0; 95% CI, -25.1 to -2.9 mL/min/1.73 m²/y; P = .01). In the subgroup of patients who had not achieved AKI recovery by discharge (n = 319), COVID-19-associated AKI was associated with decreased kidney recovery during outpatient follow-up (adjusted hazard ratio, 0.57; 95% CI, 0.35-0.92).

Conclusions and Relevance: In this cohort study of US patients who experienced in-hospital AKI, COVID-19-associated AKI was associated with a greater rate of eGFR decrease after discharge compared with AKI in patients without COVID-19, independent of underlying comorbidities or AKI severity. This eGFR trajectory may reinforce the importance of monitoring kidney function after AKI and studying interventions to limit kidney disease after COVID-19-associated AKI.

Title: Association between perioperative fluid management and patient outcomes: a multicentre retrospective study.

Citation: British journal of anaesthesia; Mar 2021; vol. 126 (no. 3); p. 720-729

Author(s): Miller, Timothy E; Mythen, Monty; Shaw, Andrew D; Hwang, Seungyoung; Shenoy, Apeksha V; Bershad, Michael; Hunley, Charles

Objective: Postoperative complications increase hospital length of stay and patient mortality. Optimal perioperative fluid management should decrease patient complications. This study examined associations between fluid volume and noncardiac surgery patient outcomes within a large multicentre US surgical cohort.

Methods: Adults undergoing noncardiac procedures from January 1, 2012 to December 31, 2017, with a postoperative length of stay ≥ 24 h, were extracted from a large US electronic health record database. Patients were segmented into quintiles based on recorded perioperative fluid volumes with Quintile 3 (Q3) serving as the reference. The primary outcome was defined as a composite of any complications during the surgical admission and a postoperative length of stay ≥ 7 days. Secondary outcomes included in-hospital mortality, respiratory complications, and acute kidney injury.

Results: A total of 35 736 patients met the study criteria. There was a U-shaped pattern with highest (Q5) and lowest (Q1) quintiles of fluid volumes having increased odds of complications and a postoperative length of stay ≥ 7 days (Q5: odds ratio [OR] 1.51 [95% confidence interval {CI}: 1.30-1.74], $P < 0.001$; Q1: OR 1.20 [95% CI: 1.04-1.38], $P = 0.011$) compared with Q3. Patients in Q5 had greater odds of more severe acute kidney injury compared with Q3 (OR 1.52 [95% CI: 1.22-1.90]; $P < 0.001$) and respiratory complications (OR 1.44 [95% CI: 1.17-1.77]; $P < 0.001$).

Conclusions: Both very high and very low perioperative fluid volumes were associated with an increase in complications after noncardiac surgery.

Title: Clinical Characteristics and Outcomes of Patients With Severe COVID-19 Induced Acute Kidney Injury.

Citation: Journal of intensive care medicine; Mar 2021; vol. 36 (no. 3); p. 319-326

Author(s): Xu, Jingyuan; Xie, Jianfeng; Du, Bin; Tong, Zhaohui; Qiu, Haibo; Bagshaw, Sean M

Objective: The incidence and outcome of Coronavirus disease 2019 (COVID-19)-induced kidney injury have been variably described. We aimed to describe the clinical characteristics, correlates and outcomes of critically ill patients with severe COVID-19 complicated by acute kidney injury (AKI).

Methods: We performed a multicenter retrospective cohort study of 671 critically ill adults with laboratory-confirmed COVID-19 from 19 hospitals in China between January 1 to February 29, 2020. Data were captured on demographics, comorbidities, symptoms, acute physiology, laboratory parameters, interventions, and outcomes. The primary exposure was ICU admission for confirmed COVID-19 related critically illness. The primary outcome was 28-day mortality. Secondary outcomes included factors associated with AKI, organ dysfunction, treatment intensity, and health services use.

Measurements and main results: Of 671 severe COVID-19 patients (median [IQR] 65 [56-73] years; male sex 65% ($n = 434$); hypertension 43% ($n = 287$) and APACHE II score 10 [7-14]), 39% developed AKI. Patients with AKI were older, had greater markers of inflammation and coagulation activation, and had greater acuity and organ dysfunction as presentation. Despite similar treatment with antivirals, patients with AKI had lower viral conversion negative rates than those without AKI. The 28-day mortality was much higher in AKI patients than patients without AKI (72% vs. 42%), and there was an increase in 28-day mortality according to the severity of AKI. Non-survivors were less likely to receive antiviral therapy

[132 (70%) vs. 65 (88%)] compared with survivors and have lower viral negative conversion rate [17 (9%) vs. 47 (64%)].

Conclusions: Acute kidney injury was quite common in severe COVID-19 pneumonia, which associated with higher mortality.

Title: Commentary on: Acute kidney injury: prevention, detection and management: summary of updated NICE guidance for adults receiving iodine-based contrast media.

Citation: Clinical Radiology; Mar 2021; vol. 76 (no. 3); p. 200-201

Author(s): Proctor ; Brady, M.E.

Title: COVID-19 patients in intensive care develop predominantly oliguric acute kidney injury.

Citation: Acta Anaesthesiologica Scandinavica; Mar 2021; vol. 65 (no. 3); p. 364-372

Author(s): Luther ; Bülow-Anderberg, Sara; Larsson, Anders; Rubertsson, Sten; Lipcsey, Miklos; Frithiof, Robert; Hultström, Michael

Title: Decreasing Rates of Acute Kidney Injury After Percutaneous Coronary Interventions Through Education and Standardized Order Sets in a Large Tertiary Teaching Center.

Citation: Current Problems in Cardiology; Mar 2021; vol. 46 (no. 3)

Author(s): daSilva-deAbreu, Adrian; Gurung, Sidhanta; Bracamonte-Baran, William; Byrnes, Patrick; Balan, Prakash; Finkel, Kevin; Smalling, Richard; Anderson, H. Vernon; Arain, Salman A.

Abstract: Acute kidney injury (AKI) is a common complication of percutaneous coronary interventions (PCI), and it is associated with increased morbidity, mortality, and healthcare costs. Post-PCI AKI is a major quality outcome measured by the National Cardiovascular Data Registry for hospitals that perform PCI. We report the experience of a large, tertiary center with high standardized, post-PCI AKI rates in which we implemented multilevel interventions that included: (1) a multidisciplinary education module for all personnel involved in care of patients undergoing cardiac angiography, (2) a standardized electronic medical record based preprocedure hydration protocol order set for patients undergoing cardiac angiography, and (3) a hydration task list to be completed by the care team the evening before the procedure or prior to admission. All this resulted in a constant decrease of the post-PCI AKI rates in remarkable magnitude, significantly stronger than the national tendency, demonstrating a center-specific behavior.

Title: Development and validation of a model for predicting acute kidney injury after cardiac surgery in patients of advanced age.

Citation: Journal of Cardiac Surgery; Mar 2021; vol. 36 (no. 3); p. 806-814

Author(s): Hu ; Chen, Yuanhan; Wu, Yanhua; Song, Li; Zhang, Li; Li, Zhilian; Fu, Lei; Liu, Shuangxin; Ye, Zhiming; Shi, Wei; Liang, Xinling

Title: Discharge characteristics and care transitions of hospitalized patients with COVID-19.

Citation: Healthcare (Amsterdam, Netherlands); Mar 2021; vol. 9 (no. 1); p. 100512

Author(s): Loerinc, Leah B; Scheel, Amy M; Evans, Sean T; Shabto, Julie M; O'Keefe, Ghazala A; O'Keefe, James B

Abstract: Little is known about the follow-up healthcare needs of patients hospitalized with coronavirus disease 2019 (COVID-19) after hospital discharge. Due to the unique circumstances of providing transitional care in a pandemic, post-discharge providers must adapt to specific needs and limitations identified for the care of COVID-19 patients. In this study, we conducted a retrospective chart review of all hospitalized COVID-19 patients discharged from an Emory Healthcare Hospital in Atlanta, GA from March 26 to April 21, 2020 to characterize their post-discharge care plans. A total of 310 patients were included in the study (median age 58, range: 23-99; 51.0% female; 69.0% African American). The most common presenting comorbidities were hypertension (200, 64.5%), obesity (BMI \geq 30) (138, 44.5%), and diabetes mellitus (112, 36.1%). The median length of hospitalization was 5 days (range: 0-33). Sixty-seven patients (21.6%) were admitted to the intensive care unit and 42 patients (13.5%) received invasive mechanical ventilation. The most common complications recorded at discharge were electrolyte abnormalities (124, 40.0%), acute kidney injury (86, 27.7%) and sepsis (55, 17.7%). The majority of patients were discharged directly home (281, 90.6%). Seventy-five patients (24.2%) required any home service including home health and home oxygen therapy. The most common follow-up need was an appointment with a primary care provider (258, 83.2%). Twenty-four patients (7.7%) had one or more visit to an ED after discharge and 16 patients (5.2%) were readmitted. To our knowledge, this is the first large study to report on post-discharge medical care for COVID-19 patients.

Title: How Reliable Is Automated Urinalysis in Acute Kidney Injury?

Citation: Laboratory Medicine; Mar 2021; vol. 52 (no. 2)

Author(s): Chandrashekar ; Tarigopula, Anil; Prabhakar, Vikram

Objective: Examination of urine sediment is crucial in acute kidney injury (AKI). In such renal injury, tubular epithelial cells, epithelial cell casts, and dysmorphic red cells may provide clues to etiology. The aim of this study was to compare automated urinalysis findings with manual microscopic analysis in AKI.

Methods: Samples from patients diagnosed with AKI and control patients were included in the study. Red blood cells, white blood cells, renal tubular epithelial cells/small round cells, casts, and pathologic (path) cast counts obtained microscopically and by a UF1000i cytometer were compared by Spearman test. Logistic regression analysis was used to assess the ability to predict AKI from parameters obtained from the UF1000i.

Results: There was poor correlation between manual and automated analysis in AKI. None of the parameters could predict AKI using logistic regression analysis. However, the increment in the automated path cast count increased the odds of AKI 93 times.

Conclusion: Automated urinalysis parameters are poor predictors of AKI, and there is no agreement with manual microscopy.

Title: Indicators of Acute Kidney Injury as Biomarkers to Differentiate Heatstroke from Coronavirus Disease 2019: A Retrospective Multicenter Analysis.

Citation: Journal of Nippon Medical School = Nippon Ika Daigaku zasshi; Mar 2021; vol. 88 (no. 1); p. 80-86

Author(s): Obinata, Hirofumi; Yokobori, Shoji; Ogawa, Kei; Takayama, Yasuhiro; Kawano, Shuichi; Ito, Toshimitsu; Takiguchi, Toru; Igarashi, Yutaka; Nakae, Ryuta; Masuno, Tomohiko; Ohwada, Hayato

Background: Coronavirus disease 2019 (COVID-19) and heat-related illness are systemic febrile diseases. These illnesses must be differentiated during a COVID-19 pandemic in summer. However, no studies have compared and distinguished heat-related illness and COVID-19. We compared data from patients with early heat-related illness and those with COVID-19.

Methods: This retrospective observational study included 90 patients with early heat-related illness selected from the Heatstroke STUDY 2017-2019 (nationwide registries of heat-related illness in Japan) and 86 patients with laboratory-confirmed COVID-19 who had fever or fatigue and were admitted to one of two hospitals in Tokyo, Japan.

Results: Among vital signs, systolic blood pressure (119 vs. 125 mm Hg, $p = 0.02$), oxygen saturation (98% vs. 97%, $p < 0.001$), and body temperature (36.6°C vs. 37.6°C, $p < 0.001$) showed significant between-group differences in the heatstroke and COVID-19 groups, respectively. The numerous intergroup differences in laboratory findings included disparities in white blood cell count ($10.8 \times 10^3/\mu\text{L}$ vs. $5.2 \times 10^3/\mu\text{L}$, $p < 0.001$), creatinine (2.2 vs. 0.85 mg/dL, $p < 0.001$), and C-reactive protein (0.2 vs. 2.8 mg/dL, $p < 0.001$), although a logistic regression model achieved an area under the curve (AUC) of 0.966 using these three factors. A Random Forest machine learning model achieved an accuracy, precision, recall, and AUC of 0.908, 0.976, 0.842, and 0.978, respectively. Creatinine was the most important feature of this model.

Conclusions: Acute kidney injury was associated with heat-related illness, which could be essential in distinguishing or evaluating patients with fever in the summer during a COVID-19 pandemic.

Title: Is COVID-19 infection more severe in kidney transplant recipients?

Citation: American journal of transplantation : official journal of the American Society of Transplantation and the American Society of Transplant Surgeons; Mar 2021; vol. 21 (no. 3); p. 1295-1303

Author(s): Caillard, Sophie; Chavarot, Nathalie; Francois, Hélène; Matignon, Marie; Greze, Clarisse; Kamar, Nassim; Gatault, Philippe; Thaunat, Olivier; Legris, Tristan; Frimat, Luc; Westeel, Pierre F; Goutaudier, Valentin; Jdidou, Mariam; Snanoudj, Renaud; Colosio, Charlotte; Sicard, Antoine; Bertrand, Dominique; Mousson, Christiane; Bamoulid, Jamal; Masset, Christophe; Thierry, Antoine; Couzi, Lionel; Chemouny, Jonathan M; Duveau, Agnes; Moal, Valerie; Blancho, Gilles; Grimbert, Philippe; Durrbach, Antoine; Moulin, Bruno; Anglicheau, Dany; Ruch, Yvon; Kaeuffer, Charlotte; Benotmane, Ilies; Solis, Morgane; LeMeur, Yannick; Hazzan, Marc; Danion, Francois; French SOT COVID Registry

Abstract: There are no studies which have compared the risk of severe COVID-19 and related mortality between transplant recipients and nontransplant patients. We enrolled two groups of patients hospitalized for COVID-19, that is, kidney transplant recipients (KTR) from the French Registry of Solid Organ Transplant ($n = 306$) and a single-center cohort of nontransplant patients ($n = 795$). An analysis was performed among subgroups matched for age and risk factors for severe COVID-19 or mortality. Severe COVID-19 was defined as admission (or transfer) to an intensive care unit, need for mechanical ventilation, or death. Transplant recipients were younger and had more comorbidities compared to nontransplant patients. They presented with higher creatinine levels and developed more episodes of acute kidney injury. After matching, the 30-day cumulative incidence of severe COVID-19 did not differ between KTR and nontransplant patients; however, 30-day COVID-19-related mortality was significantly higher in KTR (17.9% vs 11.4%, respectively, $p = .038$). Age >60 years, cardiovascular disease, dyspnea, fever, lymphopenia, and C-reactive protein (CRP) were associated with severe COVID-19 in univariate analysis, whereas transplant status and serum creatinine levels were not. Age >60 years, hypertension, cardiovascular disease, diabetes, CRP >60 mg/L, lymphopenia, kidney transplant status (HR = 1.55), and creatinine level >115 $\mu\text{mol/L}$ (HR = 2.32) were associated with COVID-19-related mortality in univariate analysis. In multivariable analysis, cardiovascular disease, dyspnea, and fever were associated with severe disease, whereas age >60 years, cardiovascular disease, dyspnea, fever, and creatinine level >115 $\mu\text{mol/L}$ retained their independent associations with mortality. KTR had a higher COVID-19-related mortality compared to nontransplant hospitalized patients.

Title: Kidney Biopsy Findings in Patients With COVID-19, Kidney Injury, and Proteinuria.

Citation: American journal of kidney diseases : the official journal of the National Kidney Foundation; Mar 2021; vol. 77 (no. 3); p. 465-468

Author(s): Nasr, Samih H; Alexander, Mariam Priya; Cornell, Lynn D; Herrera, Loren Hernandez; Fidler, Mary E; Said, Samar M; Zhang, Pingchuan; Larsen, Christopher P; Sethi, Sanjeev

Title: Kidney function testing prior to contrast-enhanced CT: a comparative cost analysis of a personalised risk-stratified pathway versus a test all approach

Citation: Clinical Radiology; Mar 2021; vol. 76 (no. 3); p. 202-212

Author(s): Shinkins B.; Abraham S.; Harris M.; Snaith B.; Lewington A.

Objective: To map current contrast-enhanced computed tomography (CT) pathways, develop a risk-stratified pathway, and model associated costs and resource use.

Materials and methods: Phase 1 comprised multicentre mapping of current practice and development of an alternative pathway, replacing pre-assessment of estimated glomerular filtration rate (eGFR) with a scan-day screening questionnaire for risk stratification and point of care (PoC) creatinine. Phase 2 measured resource use and analysis of routinely collected data, used to populate a model comparing the costs of current and risk-stratified pathways in Phase 3.

Result(s): Site variation across a range of processes within the clinical care pathway was identified. Data from a single centre suggested that 78% (n=347/447) could have avoided their pre-scan laboratory test as they did not have post-contrast acute kidney injury (AKI) risk factors. Only 24% of outpatients who underwent computed tomography (CT) would have identified risk factors, which would have prompted a scan-day PoC test. There was a 94% probability that the risk-stratified pathway was cost-saving, with an estimated 5-year potential cost saving of 69,620 (95% CI: -13,295-154,603). Although the cost of a laboratory serum creatinine test is cheaper than the PoC equivalent (5.29 versus 5.96), the screening questionnaire ruled out the need for a large majority of the eGFR measurements specifically for the CT examination.

Conclusion(s): The present study proposes an alternative pathway, which has the potential to improve the efficiency of the current CT pathway. A multicentre appraisal is required to demonstrate the impact of embedding this new pathway on a wider NHS level, particularly in light of new diagnostic guidance (DG37) published by NICE.

Title: Kidney involvement in COVID-19 and its treatments.

Citation: Journal of medical virology; Mar 2021; vol. 93 (no. 3); p. 1387-1395

Author(s): Han, Xiucui; Ye, Qing

Abstract: The lungs are the most commonly affected organ by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), but the kidneys are also frequently affected. Infection with SARS-CoV-2 can not only cause new kidney damage but also increase the difficulty of treatment and care as well as mortality for people with underlying kidney diseases. Kidney involvement in SARS-CoV-2 infection mainly manifests as kidney tubular injury. Proteinuria is the main clinical sign. To reduce patient mortality, kidney complications should be given increased attention in the diagnosis and treatment of coronavirus disease 2019 (COVID-19). This study reviews the existing literature and discusses COVID-19 infection in combination with kidney diseases in terms of kidney damage, pathogenesis, and treatment to guide clinical anti-epidemic responses.

Title: Long non-coding RNAs: A double-edged sword in aging kidney and renal disease.

Citation: Chemico-biological interactions; Mar 2021; vol. 337 ; p. 109396

Author(s): Wang, Yan-Ni; Yang, Chang-E; Zhang, Dan-Dan; Chen, Yuan-Yuan; Yu, Xiao-Yong; Zhao, Ying-Yong; Miao, Hua

Abstract: Aging as one of intrinsic biological processes is a risk factor for many chronic diseases. Kidney disease is a global problem and health care burden worldwide. The diagnosis of kidney disease is currently based on serum creatinine and urea levels. Novel biomarkers may improve diagnostic accuracy, thereby allowing early prevention and treatment. Over the past few years, advances in genome analyses have identified an emerging class of noncoding RNAs that play critical roles in the regulation of gene expression and epigenetic reprogramming. Long noncoding RNAs (lncRNAs) are pervasively transcribed in the genome and could bind DNA, RNA and protein. Emerging evidence has demonstrated that lncRNAs played an important role in all stages of kidney disease. To date, only some lncRNAs were well identified and characterized, but the complexity of multilevel regulation of transcriptional programs involved in these processes remains undefined. In this review, we summarized the lncRNA expression profiling of large-scale identified lncRNAs on kidney diseases including acute kidney injury, chronic kidney disease, diabetic nephropathy and kidney transplantation. We further discussed a number of annotated lncRNAs linking with complex etiology of kidney diseases. Finally, several lncRNAs were highlighted as diagnostic biomarkers and therapeutic targets. Targeting lncRNAs may represent a precise therapeutic strategy for progressive renal fibrosis.

Title: Moderate to Severe Acute Kidney Injury Leads to Worse Outcomes in Complex Thoracic Aortic Surgery.

Citation: The Annals of thoracic surgery; Mar 2021; vol. 111 (no. 3); p. 872-880

Author(s): Guo, Ming Hao; Tran, Diem; Glineur, David; Al-Atassi, Talal; Boodhwani, Munir

Objective: The impact of acute kidney injury (AKI) in thoracic aortic surgery is not well defined. This study aimed to examine the impact of varying severity of AKI on in-hospital and long-term outcome in these patients.

Methods: From 2004 to 2018, 1142 patients underwent thoracic aortic surgery at a single institution (University of Ottawa Heart Institute, Ottawa, Canada) and were stratified into 4 groups on the basis of the severity of postoperative AKI: no AKI (n = 705), Acute Kidney Injury Network (AKIN) stage 1 (n = 261), AKIN stage 2 (n = 72), and AKIN stage 3 (n = 104). Outcomes include in-hospital mortality, morbidity, and long-term survival. Multivariable logistic regression was used to identify independent predictors of AKI. Propensity score matching was performed to identify pairs of patients without postoperative AKI or with AKIN stage 1 AKI, as well as pairs of patients without postoperative AKI and those with AKIN stage 2 or higher AKI. Kaplan-Meier curves were plotted for late survival.

Results: In the propensity-matched cohort, patients with postoperative AKIN stage I AKI had worse in-hospital mortality but comparable long-term survival when compared with patients without postoperative AKI. Patients with AKIN stage 2 or higher AKI experienced significantly higher in-hospital mortality compared with patients without postoperative AKI (15.9% vs 4.6%; $P < .01$) and worse 8-year survival ($65.9\% \pm 34.1\%$ vs $80.1\% \pm 20.0\%$; $P < .01$).

Conclusions: Moderate to severe AKI is a serious complication and is associated with significantly worse short- and long-term outcomes; targeting mild AKI with therapeutic intervention is an important step in improving patient outcomes.

Title: Predictors of postoperative acute kidney injury in patients undergoing hip fracture surgery: A systematic review and meta-analysis.

Citation: Injury; Mar 2021; vol. 52 (no. 3); p. 330-338

Author(s): Zhou ; Zhang, Yijian; Teng, Yun; Chen, Angela Carley; Liu, Tao; Yang, Huilin; He, Fan

Title: Preliminary Assessment of Acute Kidney Injury in Critically Ill Children Associated with SARS-CoV-2 Infection: A Multicenter Cross-Sectional Analysis.

Citation: Clinical journal of the American Society of Nephrology : CJASN; Mar 2021; vol. 16 (no. 3); p. 446-448

Author(s): Bjornstad, Erica C; Krallman, Kelli A; Askenazi, David; Zappitelli, Michael; Goldstein, Stuart L; Basu, Rajit K; SPARC Investigators

Title: The significance of acute kidney injury in Clostridioides difficile infection.

Citation: International Journal of Clinical Practice; Mar 2021; vol. 75 (no. 3); p. 1-8

Author(s): Avni ; Hammud, Hani; Itzhaki, Oranit; Gafer-Gvili, Anat; Rozen-Zvi, Benaya; Ben-Zvi, Haim; Bishara, Jihad; Atamna, Alaa

Sources Used: The following databases are used in the creation of this bulletin: CINAHL, EMBASE, 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.