

# Hospital acquired AKI: common, costly & associated with poor outcomes

## Healthcare utilization after acute kidney injury in the pediatric intensive care unit

- AKI in the pediatric intensive care unit is associated with higher risk for post-discharge hospitalizations and physician visits, independent of baseline, admission, and chronic illness variables.
- AKI was associated with approximately 40% higher adjusted risk of rehospitalization 1 year post-discharge and 60%–80% higher risk for 5-year rehospitalizations.
- AKI was associated with more frequent 5-year outpatient physician visits; <25% of these children with AKI saw a nephrologist 5 years post-discharge.

➤ Hessey E, Morissette G, Lacroix J, et al. Healthcare Utilization after Acute Kidney Injury in the Pediatric Intensive Care Unit. *Clin J Am Soc Nephrol.* 2018;13(5):685–692. doi:10.2215/CJN.09350817

## Stop adding insult to injury: identifying and managing risk factors for the progression of acute kidney injury in children

- Over one-third of children treated for AKI had reduced kidney function, or remained dialysis dependent, at the time of discharge from hospital.
- 10% of children treated for AKI in the ICU had CKD within 1-3 years.
- 5% of pediatric heart transplant recipients developed CKD by their 12-month follow-up.

➤ Hayes W. Stop adding insult to injury—identifying and managing risk factors for the progression of acute kidney injury in children. *Pediatr Nephrol.* 2017;32(12):2235–2243. doi:10.1007/s00467-017-3598-3

## The economic consequences of acute kidney injury

- AKI is expensive and consumes considerable healthcare resources.
- The most conservative estimates attribute approximately \$1,700 in excess costs for each episode of AKI and \$11,000 in excess costs for each episode of dialysis-requiring AKI.
- In the United States, at least \$5 billion in hospital costs are related to AKI.

➤ Silver S, A, Chertow G, M: *The Economic Consequences of Acute Kidney Injury.* *Nephron* 2017;137:297-301. doi: 10.1159/000475607

## Health care costs associated with AKI

- The severity of AKI, the need for dialysis, and the lack of kidney recovery are all associated with significant increases in health care resource utilization and costs in patients who are hospitalized
- AKI was associated with increases in length of stay: 2.5-7.6 days by AKI severity and the need for dialysis.
- Incremental costs were 1.31-2.56-fold greater and increased in a graded fashion by AKI severity: \$3,800 per patient with mild AKI versus \$18,300 per patient requiring dialysis.

➤ Collister D, Pannu N, Ye F, James M, et al. Health Care Costs Associated with AKI. *CJASN* 2017;12 (11):1733-1743; DOI: <https://doi.org/10.2215/CJN.00950117>

## Epidemiology of acute kidney injury in critically ill children and young adults

- AKI occurred in 25% of patients during the first 7 days after ICU admission.
- Assessment of AKI according to the plasma creatinine level alone failed to identify AKI in 2/3 of the patients with low urine output.
- The common and early occurrence of acute kidney injury reinforces the need for systematic surveillance for acute kidney injury at the time of admission to the ICU.

➤ Ahmad Kaddourah A, Basu R, Bagshaw SM, Goldstein SL for the AWARE Investigators. Epidemiology of acute kidney injury in critically ill children and young adults. *N Engl J Med* 2017;376:11-20 DOI: 10.1056/NEJMoa1611391

## Progression of chronic kidney disease after acute kidney injury

- The incidence of clinically apparent CKD was particularly high in critically ill hospitalized children with AKI, in the range of 30–60% of patients at follow up.
- AKI is recognized to play a major role in the development of CKD and links between duration, severity, and frequency of AKI episodes and development of CKD have been established.
- Long term follow up of children with AKI up into and throughout adulthood is required to detect subclinical and clinical progression to CKD and especially for the management of the cardiovascular sequelae of CKD progression.

➤ Devarajan P, Jefferies JL. Progression of chronic kidney disease after acute kidney injury. *Prog Pediatr Cardiol*. 2016;41:33–40. doi:10.1016/j.ppedcard.2015.12.006