

## 1.2 ACUTE KIDNEY INJURY

Acute kidney injury (AKI), also known as acute renal failure (ARF), is a decline in renal function over a period of hours or days that results in the accumulation of nitrogenous waste products and an impaired ability to maintain fluid/electrolyte/acid-base homeostasis. Epidemiologic studies of AKI are confounded by inconsistent definitions and underreporting. The average incidence is estimated to be 23.8 cases per 1000 hospital discharges.<sup>1</sup> Approximately 5% to 20% of critically ill patients experience AKI during the course of their illness.<sup>2</sup> AKI may present in isolation, develop as a complication of other comorbid illness, or result as a deleterious adverse effect of treatment or diagnostic interventions. Uncomplicated AKI is associated with a mortality rate of up to 10%.<sup>3-6</sup> Patients with AKI and multiorgan failure have mortality rates higher than 50%.<sup>3-6</sup> AKI is associated with an increased length of hospital stay; a rise in serum creatinine of 0.5 mg/dL or greater while hospitalized confers a 3.5-day increase in length of stay.<sup>7</sup> Hospitalists facilitate the expeditious evaluation and management of AKI to improve patient outcomes, optimize resource use, and reduce length of stay. Hospitalists can also advocate and initiate preventive strategies to reduce the incidence of secondary AKI.

**KNOWLEDGE**

*Hospitalists should be able to:*

- Describe the symptoms and signs of AKI.
- Describe and differentiate pathophysiologic causes of AKI including prerenal, intrinsic renal, and postrenal processes.
- Differentiate among the causes of prerenal, intrinsic renal, and postrenal types of AKI.
- Describe a logical sequence of indicated tests required to evaluate etiologies of AKI based on classification of AKI type.
- List common potentially nephrotoxic agents that can cause or worsen AKI.
- Explain the indications, contraindications, and mechanisms of action of the interventions used to treat AKI.
- Explain the indications, contraindications, benefits, and risks of acute hemodialysis.
- Recognize indications for specialty consultation for AKI and the role of nephrology and/or urology specialists.
- Describe criteria, including specific measures of clinical stability, that must be met before discharging patients with AKI.
- Explain the specific goals that should be met to ensure safe transitions of care for patients with AKI.

**SKILLS**

*Hospitalists should be able to:*

- Assess patients with suspected AKI in a timely manner and manage or comanage the patient with the primary requesting service.
- Elicit a thorough and relevant medical history with em-

phasis on factors predisposing or contributing to the development of AKI.

- Review all drug use including prescription and over-the-counter medications, herbal remedies, nutritional supplements, and illicit drugs to identify common potential nephrotoxins.
- Perform a physical examination to assess volume status and to identify underlying comorbid states that may predispose to the development of AKI.
- Order and interpret results of indicated diagnostic studies that may include urinalysis and microscopic sediment analysis, urinary diagnostic indices, urinary protein excretion, serologic evaluation, and renal imaging.
- Interpret common clinical, laboratory, and imaging findings used to evaluate and follow the severity of AKI.
- Diagnose common complications, such as electrolyte abnormalities, that occur with AKI and institute corrective measures.
- Calculate estimated creatinine clearance for medication dosage adjustments when indicated.
- Identify patients at risk for developing AKI and institute appropriate preventive measures including avoidance of unnecessary radiographic contrast exposure and adherence to evidence-based interventions to reduce the risk of contrast-induced nephropathy.
- Coordinate appropriate nutritional and metabolic interventions.
- Formulate an AKI treatment plan tailored to the individual patient, which may include fluid management, pharmacologic agents, nutritional recommendations, and patient education.
- Identify and treat factors that may complicate the management of AKI, including extreme blood pressure, underlying infections, and the sequelae of electrolyte abnormalities.
- Communicate with patients and families to explain the cause and prognosis of AKI.
- Communicate with patients and families to explain the rationale for the use of radiographic tests and procedures and the benefit and potential adverse effects of radiographic contrast agents.
- Facilitate discharge planning early during hospitalization.
- Communicate with patients and families to explain the goals of care, discharge instructions, and management after hospital discharge to ensure safe follow-up and transitions of care.
- Document the treatment plan and provide clear discharge instructions for postdischarge clinicians.

**ATTITUDES**

*Hospitalists should be able to:*

- Employ a multidisciplinary approach, which may include nursing, nutrition, and pharmacy services, in the care of

patients with AKI that begins at admission and continues through all care transitions.

- Follow evidence-based recommendations, protocols, and risk-stratification tools for the treatment of AKI.

### SYSTEM ORGANIZATION AND IMPROVEMENT

*To improve efficiency and quality within their organizations, hospitalists should:*

- Advocate for, establish, and support initiatives to reduce the incidence of iatrogenic AKI.
- Lead, coordinate, and/or participate in multidisciplinary teams (including nephrology, nursing, pharmacy, and nutrition services) to improve processes that facilitate early identification of AKI and improved patient outcomes.
- Lead, coordinate, and/or participate in multidisciplinary initiatives to promote patient safety and optimize management strategies for AKI.

### References

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