

## ACUTE KIDNEY INJURY

## Fluid overload increases mortality in critically ill children

Severity of fluid overload is adversely associated with survival in critically ill children on continuous renal replacement therapy (CRRT), according to a new study. “The most significant finding was the association between greater fluid overload at CRRT initiation and higher mortality. This finding remained significant even after adjusting for severity of illness,” says the study’s corresponding author, Scott Sutherland from Stanford University.

CRRT is widely used in the management of acutely ill pediatric patients with hemodynamic instability, acute kidney injury or fluid overload. However, the optimal timing for initiation of CRRT is unknown and previous work suggested that greater fluid overload is associated with greater mortality in critically ill children receiving CRRT.

Sutherland and colleagues investigated the association between fluid overload and mortality in 297 children receiving CRRT across 13 centers in the US, using data from the Prospective Pediatric CRRT Registry. “The registry was initially created to address issues that plague the pediatric acute kidney injury

literature ... we undertook this particular project to more completely describe the relationship between fluid overload and mortality in children receiving CRRT,” clarifies Sutherland.

The researchers observed that more than half the participants had <10% fluid overload, just under one-third of patients had  $\geq 20\%$  overload whilst the remainder had 10–20% fluid overload. They found that patients with  $\geq 20\%$  fluid overload had a significantly higher risk of mortality than those with 10–20% or <10% fluid overload. Patients with  $\geq 20\%$  fluid overload had a nearly ninefold higher risk of dying than those with <20% overload. “Our analysis suggested that each 1% increase in fluid overload at CRRT initiation is associated with a 3% increase in mortality,” explains Sutherland.

“This research demonstrates definitively that waiting until patients are more fluid overloaded prior to initiating CRRT results in greater mortality,” comments Sutherland. He adds that more research is needed to define the optimal fluid thresholds and timing for CRRT initiation in critically ill children, and to



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determine whether earlier initiation of CRRT improves patient outcome.

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