



## Out with the saline? Reduced use linked to better outcomes



Two companion studies have shown that use of saline as intravenous fluid therapy, in comparison to crystalloids, was associated with poor survival and increased risk of kidney complications.

"Our results suggest that using primarily balanced fluids should prevent death or severe kidney dysfunction for tens of thousands of patients across the country each year," said study author Matthew Semler, MD, MSc, assistant professor of Medicine at Vanderbilt University School of Medicine. "Because balanced fluids and saline are similar in cost, the finding of better patient outcomes with balanced fluids in two large trials has prompted a change in practice at Vanderbilt toward using primarily balanced fluids for intravenous fluid therapy."

The Vanderbilt research examined over 15,000 intensive care patients and over 13,000 emergency department patients, in pragmatic cluster randomised multiple crossover trials. Patients were assigned to receive saline (0.9% sodium chloride) or balanced fluids (lactated Ringer's solution or Plasma-Lyte A) if they required intravenous fluid. Relative contraindications to the use of balanced crystalloids included hyperkalaemia and brain injury. The primary outcome was a major adverse kidney event within 30 days.

In the critically ill patient group, of 7942 patients in the balanced fluids group, 1139 (14.3%) had a major adverse kidney event. In the saline group 1211 of 7860 patients (15.4%) had an adverse kidney event. The incidence of new renal replacement therapy was 2.5% and 2.9% respectively, and the incidence of persistent renal dysfunction was 6.4% and 6.6% respectively. In subgroup analysis, the difference between the balanced crystalloids group and the saline group was greater among patients who received larger volumes of isotonic crystalloid and among patients with sepsis. In septic patients, 30 day in-hospital mortality was 25.2% with balanced crystalloids and 29.4% with saline.

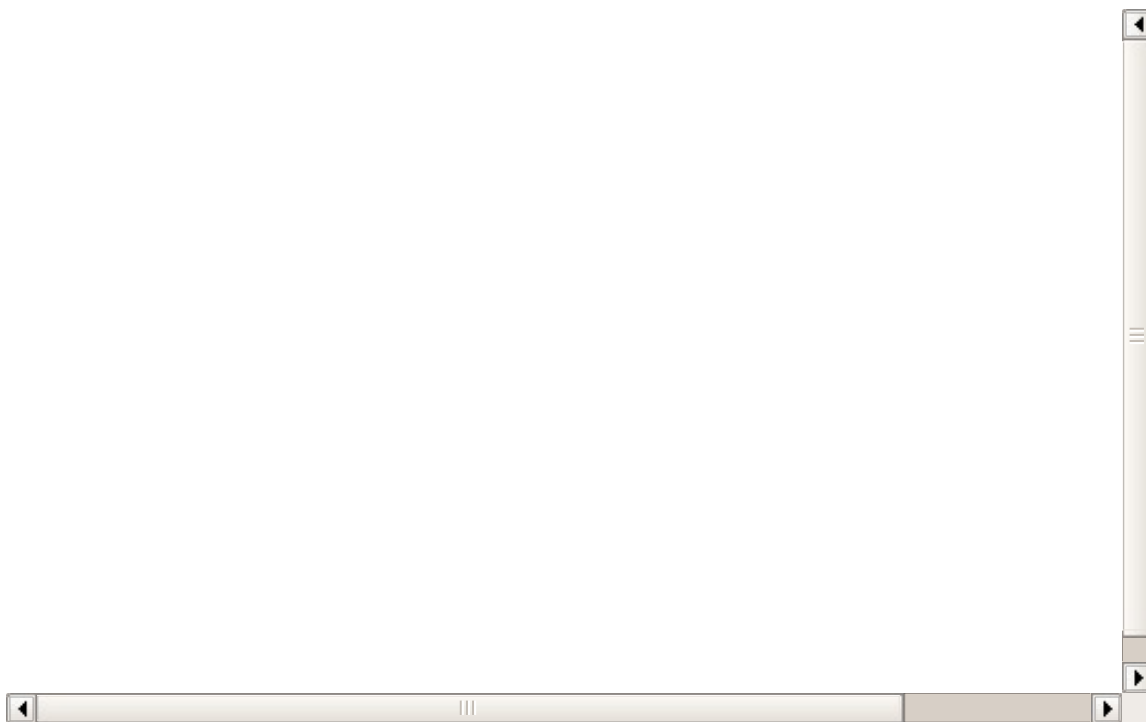
"The difference, while small for individual patients, is significant on a population level. Each year in the United States, millions of patients receive intravenous fluids," said study author Wesley Self, MD, MPH, associate professor of Emergency Medicine.

The researchers state that the results suggest that the use of balanced crystalloids rather than saline "might prevent 1 patient among every 94 patients admitted to an ICU from the need for new renal replacement therapy, from persistent renal dysfunction, or from death."

The researchers note that the study's strengths include its large sample size, while its limitations are that a single centre study limits generalisability. Also, a doctor's decision to start renal replacement therapy may be susceptible to treatment bias.

In the study comparing fluids in non-critically ill patients, balanced crystalloids did not result in shorter time to hospital discharge than saline, but did result in lower incidence of the composite of death, new renal replacement therapy and persistent renal dysfunction.

## Watch



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