Choice of intravenous fluid therapy could improve survival in critically ill patients

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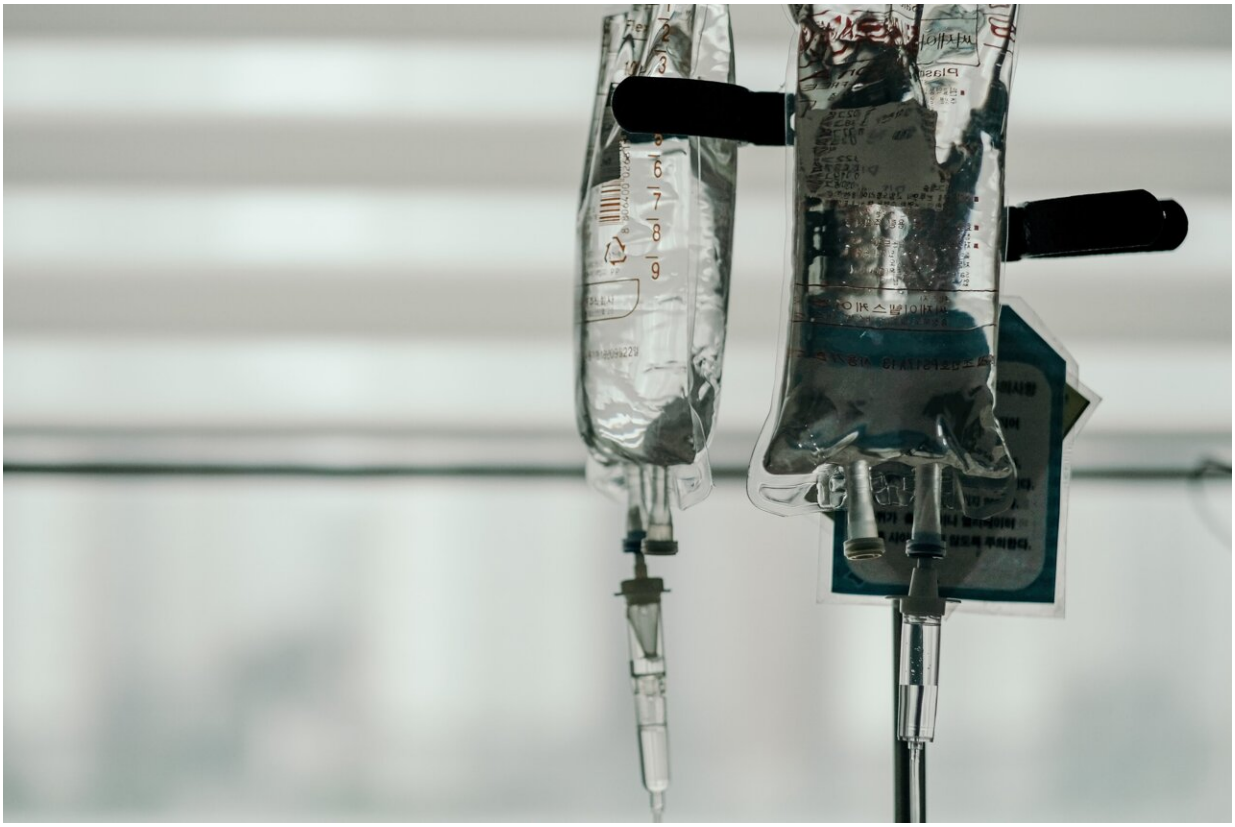

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Results of a new meta-analysis show that intravenous fluid (IV) therapy using balanced solutions rather than commonly used saline can reduce the risk of in-hospital death of critically ill patients by 4%.

Findings from the BEST-Living Study were presented at the Critical Care Canada Forum (CCCF 2023) and simultaneously published in *The Lancet Respiratory Medicine*.

Prof Simon Finfer AO, an Intensive Care physician, Professorial Fellow at The George Institute for Global Health, and Adjunct Professor, UNSW Sydney—who was the senior author on the paper—said the results supported the important role of IV fluid choice in the treatment of intensive care patients.

"Our research shows that balanced fluids are a better treatment for most intensive care patients, and are associated with lower mortality rates than saline," he said.

"While the positive effects were modest, this evidence can help clinicians make more informed choices about which intravenous fluids to use for their patients in critical care and increase the chance of most patients surviving their critical illness."

Nearly all patients admitted to an intensive care unit will require intravenous fluids as part of their standard treatment. These fluids can be made up of saline (0.9% sodium chloride), or balanced crystalloids, which more closely match chemistry of human blood.

However, no individual trial of balanced solutions versus saline to date has reported a statistically significant effect on mortality.

To examine this more closely, an international group of researchers analyzed data involving 34,685 patients across six clinical trials conducted in the U.S., Australia, New Zealand and Brazil.

They found a 4% relative reduction in the odds of dying when patients were given balanced solutions. Among patients on balanced solutions,

16.8% died in hospital, versus 17.3% who received saline suggesting that one life is saved for every 250 patients treated.

Additionally, 5.6% of patients required renal replacement therapy (dialysis) in the balanced group, compared with 5.9% of patients assigned saline.

Naomi Hammond, Critical Care Program Head at The George Institute and Associate Professor, Faculty of Medicine, UNSW Sydney said there was an important caveat that in the small subset of patients with traumatic brain injury the risk of death was higher with balanced solutions (19.1%) versus saline (14.7%).

"While the results showed that overall, there is a high probability that use of balanced solutions compared with saline is associated with reduced in-hospital mortality and less need for renal replacement therapy—or dialysis—we saw that in patients with traumatic brain injury, balanced solutions probably increase mortality," she said.

"However, balanced solutions are generally more expensive than saline and in settings where resources are limited and there is a greater disparity between the price of balanced and saline solutions, such a benefit may not be deemed cost-effective."

The BEST-Living Study will be repeated annually to include new eligible trial data within its analysis.

More information: Simon Finfer et al, Balanced crystalloids versus saline for critically ill patients (BEST-Living): a systematic review and individual patient data meta-analysis, *The Lancet Respiratory Medicine* (2023). DOI: 10.1016/S2213-2600(23)00417-4

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