

Not Salty Enough

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We commend Gottenborg and Pierce on their well-written summary of the 2013 National Institutes of Care Excellence (NICE) guidelines on intravenous fluids (IV) for adults.¹ One area of the guidelines that we believe should be modified is the outdated recommendation for prescribing 1 mmol/kg/day of sodium.² At the guideline recommended rate of 25-30 mL/kg/day, a 75 kg adult would be prescribed a solution of 25-30 mmol/L of sodium or 0.18% saline, which is in stark contrast to the more recent recommendations of isotonic fluids from the 2018 American Academy of Pediatrics and 2015 NICE pediatric guidelines.^{3,4} 0.18% saline is extremely hypotonic compared to plasma sodium and would place hospitalized patients at significant risk for developing hospital-acquired hyponatremia.

The recommendations for hypotonic solutions were largely developed from theoretical research in the 1950s before the first description of the syndrome of inappropriate secretion of antidiuretic hormone.⁵ Hospitalized patients are at significant risk for nonosmotic stimuli for antidiuretic hormone secretion, and hypotonic fluids increase the risk of hyponatremia, which can have catastrophic complications. We believe the pediatric

evidence should be extrapolated and included with the supporting (albeit limited) adult evidence, and that when indicated, isotonic fluids should be the maintenance fluid for most hospitalized adults.^{3-4,6}

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References

1. Gottenborg E, Pierce R. Clinical Guideline Highlights for the Hospitalist: The Use of Intravenous Fluids in the Hospitalized Adult. *J Hosp Med.* 2019;14(3):172-173. <https://doi.org/10.12788/jhm.3178>
2. National Clinical Guideline Centre. Intravenous Fluid Therapy: Intravenous Fluid Therapy in Adults in Hospital, London: Royal College of Physicians (UK); 2013 Dec. Updated May 3, 2017. <https://www.nice.org.uk/guidance/g174>. Accessed April 6, 2019.
3. Feld LG, Neuspiel DR, Foster BA, et al. Clinical practice guideline: maintenance intravenous fluids in children. *Pediatrics.* 2018;142(6):170-171. <https://doi.org/10.1542/peds.2018-3083>
4. Neilson J, O'Neill F, Dawoud D, Crean P, Guideline Development G. Intravenous fluids in children and young people: summary of NICE guidance. *BMJ.* 2015;351:h6388. <https://doi.org/10.1136/bmj.h6388>
5. Talbot NB, Crawford DJ, Butler AM. Medical progress; homeostatic limits to safe parenteral fluid therapy. *N Engl J Med.* 1953;248:1100-1108. <https://doi.org/10.1056/NEJM195306252482605>
6. Okada M, Egi M, Yokota Y, et al. Comparison of the incidences of hyponatremia in adult postoperative critically ill patients receiving intravenous maintenance fluids with 140 mmol/L or 35 mmol/L of sodium: retrospective before/after observational study. *J Anesth.* 2017;31(5):657-663

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