



Pediatric IV Fluid SBAR

Situation

The American Academy of Pediatrics (AAP) updated their [Clinical Practice Guideline: Maintenance Intravenous Fluids in Children](#) in December 2018. The updated guidance emphasizes “...patients 28 days to 18 years of age requiring maintenance IV fluids should receive isotonic solutions with appropriate potassium chloride and dextrose because they significantly decrease the risk of developing hyponatremia”¹. Implementation of updated guidelines is variable across institutions.

Background

Previously hypotonic fluids, such as D5 0.2% NaCl and D5 0.45% NaCl, were recommended for this age group. However, the relationship between the administration of hypotonic IV fluids and hospital-acquired hyponatremia, an electrolyte abnormality, has been shown in various studies. The United States, Canada, and United Kingdom release reports on deaths from hyponatremia in patients who were hospitalized and received hypotonic IV fluids. In 2003, it was recommended that isotonic fluids be administered to prevent the destabilization of electrolytes. In 2016, the AAP convened a subcommittee to review the clinical practice guidelines of maintenance IV fluids and found that the previous recommendations of using hypotonic solutions were based on theoretical grounds. The updated recommendations were made using an evidence-based approach and are provided to prevent hyponatremia and acute or permanent neurologic impairment related to it.

Assessment

Staying up to date with best practice changes is vital to the safety of our patients and the quality of care we provide. Studies have shown the effectiveness of using isotonic, balanced IV fluids for patients aged 28 days to 18 years, except in those individuals where such fluids are contraindicated.

Recommendation

The recommendation of the MHA Pediatrics Committee is that patients 28 days to 18 years of age requiring maintenance IV fluids should receive isotonic solutions unless contraindicated. Hospitals and health systems should continue to share messaging on these recommendations. Education at the local or provider level, EHR hardwires for standard orders, choice architecture and provider guidance language are also recommended.

¹Feld, L. G., Neuspiel, D. R., Foster, B. A., Leu, M. G., Garber, M. D., Austin, K., Basu, R. K., Conway, E. E., Fehr, J. J., Hawkins, C., Kaplan, R. L., Rowe, E. V., Waseem, M., & Moritz, M. L. (2018, December 1). *Clinical practice guideline: Maintenance intravenous fluids in children*. American Academy of Pediatrics. Retrieved June 14, 2022, from <https://publications.aap.org/pediatrics/article/142/6/e20183083/37529/Clinical-Practice-Guideline-Maintenance>

²Ibid

³Ibid

⁴Ibid



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Composition of Commonly Used Maintenance IV Fluids

Fluid	Sodium	Chloride	Potassium, mEq/L	Calcium	Magnesium	Buffer	Osmolarity, mOsm/L	pH
Human plasma	135-145	95-105	3.5-5.3	4.4-5.2	1.6-2.4	23-30 bicarbonate	308	7.4
Isotonic and/or near-isotonic solutions (recommended)								
Fluid	Sodium	Chloride	Potassium, mEq/L	Calcium	Magnesium	Buffer	Osmolarity, mOsm/L	pH
D ₅ 0.9% NaCl	154	154	0	0	0	0	308	5.5
D ₅ lactated Ringer	130	109	4	3	0	28 lactate	273	5
Normosol/ PlasmaLyte	140	98	5	0	3	27 acetate and 23 gluconate	294	7.4
Lactated Ringer's 5% Dextrose in water (D5LRS)	130	109	4	2.7		28 lactate	525	5
Hypotonic solutions								
Fluid	Sodium	Chloride	Potassium, mEq/L	Calcium	Magnesium	Buffer	Osmolarity, mOsm/L	pH
D ₅ 0.2% NaCl	34	34	0	0	0	0	78	4.3
D ₅ 0.45% NaCl	77	77	0	0	0	0	154	4.3

*Patients younger than 28 days may have Dextrose added by x% to solutions.