

# Infants With Febrile Urinary Tract Infections and Length of Antibiotic Therapy: A Commentary

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Although the American Academy of Pediatrics provides evidence-based recommendations for the management of infants and neonates between 2 months and 2 years of age with febrile urinary tract infections (UTIs),<sup>1,2</sup> there is a paucity of data regarding the evaluation and treatment of febrile UTIs in infants <2 months of age.

In their study, Joshi et al<sup>3</sup> attempt to use this lack of data to reveal variability in treatment and diagnostic plans among physicians with regard to the management of UTIs in this age group. The investigators presented pediatricians of different subspecialties with a clinical vignette of a 2-week-old neonate with a febrile UTI without bacteremia who had received 2 days of intravenous (IV) antibiotics. They then stratified respondents by, among other things, subspecialty (pediatric infectious diseases [IDs], neonatology, and “general pediatricians,” the latter included inpatient and outpatient physicians) and asked questions regarding preferred length of IV antibiotic therapy, desire to obtain a voiding cystourethrogram, and prophylactic antibiotic therapy.

The study had a reasonable survey completion rate (64%), although it had a low participation rate (13%), and was well designed. The investigators identified significant variability in physician preference for length of IV antibiotic courses between specialties. General pediatricians preferred the shortest course of IV antibiotics with a median duration at the minimum possible answer choice (2 additional days), whereas pediatric ID subspecialists and neonatologists recommended continuation for 5 and 7 additional days, respectively.

The authors also investigated potential drivers of physician behavior such as medical literature, institutional standards of care, concerns about harm from treatment, and medicolegal issues; however, the correlations were not strong, although some were statistically significant. We did find it interesting that despite the lack of high-quality outcomes data in this patient population, 19.4% of respondents reported that the quality of evidence was “Level A” (well-designed randomized controlled trials).

The authors highlight the variability in management of neonatal UTIs and note that this variability is often a sign of health care resource overuse.<sup>4,5</sup> This study, it might be obviously apparent, will likely be appreciated by pediatric hospitalists because it suggests they are the group most likely to limit antibiotic utilization and, therefore, the value argument is in play. In other words, a pediatric hospitalist may examine these data to validate their position in the hospital as someone who chooses wisely or decreases utilization. However, we must be careful about self-congratulation here for 3 reasons.

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First, as the authors state, there are few outcomes data available. Therefore, we don't know what the correct answer is and what the ideal time course of antibiotics should be. A hospitalist might argue that we provide value by (in cases of ubiquitous, absent or conflicting data) erring on the side of less treatment rather than more, thereby reducing the risk of iatrogenic harm. However, the opposing viewpoint that we need to be extra cautious with very young infants could also be made. The authors correctly stop short of arguing that one treatment length is better than another and instead simply use their data to suggest that physicians of different pediatric subspecialties treat patients differently. We would caution readers of this article to do the same, rather than claiming credence one way or the other. The value argument only works if quality and cost are assessed, and, in this case, they were not. We do not know enough about clinical outcomes to make a reasonable determination about the impact of varying antibiotic treatment courses on quality of care.

Second, because the results reflect the values of each specialty in the absence of strong evidence, there may be a significant Hawthorne effect at work (in which individuals modify their behavior because they know they are being observed). Apparent in these data are a core tenant of pediatric hospital medicine, a focus on value-based care. The field pushes itself to increase the quality of care for children admitted to our hospitals and to find ways to do less while still being safe. Hospitalists strive to do less and still maintain patient outcomes. They aim to improve the quality of hospital-based pediatrics while providing cost-effective medicine. This identity may reflect or exaggerate itself when

hospitalists read a vignette such as the one posed in this study. An astute hospitalist, knowing that there is not a specific guideline available, may try to pick the correct answer for their field by selecting the most minimal option. This may be less likely the case for other pediatric subspecialists given how strongly the identity of pediatric hospital medicine is tied to providing value in health care; some might argue it is tied rather strongly. This vignette was an academic exercise rather than real-world treatment, allowing a hospitalist to select what they think might be the correct answer without having to worry about real-world consequences such as the potential for harm. It is easy to answer "2 days" on a survey, but it is harder to do so with a live newborn.

Third, a physician's experience with their patient population likely plays a role in their choice of treatment length. Neonatologists treat the sickest of infants and often have to provide aggressive therapy to save lives, which may be reflected by a preference for a longer IV antibiotic course. Pediatric ID physicians who specialize in the diagnosis and treatment of infections opted most commonly for 5 days of IV antibiotics, which may reflect the absence of clear prospective data and a concern for the more advanced infections they are used to seeing. Pediatric hospitalists often treat well-appearing infants with bacterial infections and may be more comfortable treating these specific patients in a less aggressive manner.

Notably, the general pediatrician group includes hospitalists and primary care pediatricians, which, again, should attenuate any conclusions drawn about the specific behavior of pediatric hospitalists relative to other subspecialties.

Although it may not be surprising that their responses were different than those of pediatric ID subspecialists or neonatologists, the fact that Joshi et al<sup>5</sup> felt it necessary to sample pediatric hospitalists suggests a value of the field in its own right. It serves as an almost subliminal validation that the medical opinions of pediatric hospitalists (as pediatric subspecialists) are and should be valued. Today, not only are they sampled, but it is possible that the majority of neonates with febrile UTIs are being managed by pediatric hospitalists. The field has come far rather quickly, and we are excited to see what the future brings.

## REFERENCES

1. Roberts KB; Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary tract infection: clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. *Pediatrics*. 2011;128(3):595–610
2. Hoberman A, Greenfield SP, Mattoo TK, et al; RIVUR Trial Investigators. Antimicrobial prophylaxis for children with vesicoureteral reflux. *N Engl J Med*. 2014;370(25):2367–2376
3. Joshi NS, Lucas BP, Schroeder AR. Physician preferences surrounding urinary tract infection management in neonates. *Hosp Pediatr*. 2018;8(1).
4. Nassery N, Segal JB, Chang E, Bridges JFP. Systematic overuse of healthcare services: a conceptual model. *Appl Health Econ Health Policy*. 2015;13(1):1–6
5. Morgan DJ, Brownlee S, Leppin AL, et al. Setting a research agenda for medical overuse. *BMJ*. 2015;351:h4534

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