

Neonatal Abstinence Syndrome and the Pediatric Hospitalist: 5 Years Later

Kathryn Dee L. MacMillan, MD,^{a,b,c} Alison Volpe Holmes, MD, MS, MPH^{a,b,c}

As the US opioid crisis grows, neonatal abstinence syndrome (NAS) is increasingly common in inpatient settings, from community-hospital nurseries to inpatient units and NICUs at large children's hospitals. NAS is stressing perinatal care systems because of lengthy and costly hospital stays and is garnering attention not only in health care but also in public policy circles and the media.¹ Commensurate with the dramatic increase in NAS cases, in some settings, the management of NAS is shifting from neonatology to pediatric hospital medicine. This represents a unique opportunity.

In this issue of *Hospital Pediatrics*, Milliren et al² report significant variability in NAS care practices across US hospitals, including rates of pharmacotherapy use, choice of treatment medication, length of treatment, and length of stay. These inconsistencies exist despite the majority of US hospitals using some form of the Finnegan Neonatal Abstinence Scoring System (FNASS) to assess infants with NAS. This is less surprising when one considers that neither the tool (which was created in 1975) nor the protocols developed for its clinical application have ever been rigorously validated.³ As Milliren et al² find, treatment with pharmacologic agents is associated with higher costs and longer lengths of stay. Because rates of medication use for symptom management vary by hospital from 13% to 90% of exposed newborns, there is likely substantial room for a reduction of pharmacotherapy in many localities.² In addition to the material costs of pharmacotherapy and the associated lengthy hospitalizations, mothers report disrupted bonding and increased feelings of guilt and stigma. Inconsistencies in clinical management and communication further detract from the family experience.^{4,5}

What is the role of the hospitalist in all this? In the space between intensivists and primary care, the pediatric hospitalist can offer a different perspective and propose alternative methods and modalities to bridge gaps in care. The hospitalist is aware that less is often more, and if a condition can effectively be managed more simply, less invasively, or even at home, this is the preferable course. It is possible to avoid unnecessary therapies, potential harms, and disruption of family life. At times, this requires thinking creatively and questioning customary practices.

The American Academy of Pediatrics 2012 Policy Statement on neonatal drug withdrawal makes it clear that the first line of treatment of withdrawal is not morphine, methadone, or phenobarbital.⁶ It is not any medication but rather attention to the environment of the infant and minimizing overstimulation and hunger while providing soothing support, such as holding, rocking, and swaddling. Before turning to drugs, we are called to first ensure an environment that is ideal for any newborn.

www.hospitalpediatrics.org

DOI:<https://doi.org/10.1542/hpeds.2017-0216>

Copyright © 2018 by the American Academy of Pediatrics

Address correspondence to Kathryn Dee L. MacMillan, MD, Department of Pediatrics, Children's Hospital at Dartmouth-Hitchcock, One Medical Center Dr, Lebanon, NH 03766. E-mail: kathryn.dee.l.macmillan@hitchcock.org

HOSPITAL PEDIATRICS (ISSN Numbers: Print, 2154-1663; Online, 2154-1671).

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: No external funding.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

Drs MacMillan and Holmes conceived the ideas to be included; Dr MacMillan wrote the initial draft; Dr Holmes edited the initial draft and made additional conceptual contributions; and both authors approved the final manuscript as submitted.

Opinions expressed in these commentaries are those of the author and not necessarily those of the American Academy of Pediatrics or its Committees.

FREE

^aChildren's Hospital at Dartmouth-Hitchcock and
^bDartmouth-Hitchcock Medical Center, Lebanon, New Hampshire; and
^cGeisel School of Medicine, The Dartmouth Institute, Dartmouth College, Hanover, New Hampshire

Pediatric hospitalists are well positioned to transition the care setting away from NICUs, which often have an open-bay setup, to support management in nurseries or pediatric wards, where the care environment can be optimized. In these rooming-in settings, nonpharmacologic interventions, including skin-to-skin contact, breastfeeding, and a low-stimulus environment, are easier to implement.

It may also be time to change the traditional approach to NAS symptom assessment and strictly protocolized pharmacologic responses to standardized withdrawal scores. Emerging evidence suggests that strict protocols based on the FNASS potentiate an overtreatment of newborns with pharmacologic agents.^{7,8} The long-term outcomes related to these treatments are not fully understood. Also in this issue, Grossman et al⁹ propose an alternative to the FNASS for evaluation of and response to newborn opioid withdrawal. They dispense with adding up points for a long list of withdrawal items, such as the incidence of sneezes, yawns, and scratches. Instead of cataloguing signs and symptoms with questionable clinical implications, they favor a formal assessment of the newborn's ability to eat, sleep, and be consoled. These factors are arguably the chief concerns of the newborn and parents and follow the American Academy of Pediatrics guideline directive that "the goals of therapy are to ensure that the infant achieves adequate sleep and nutrition to establish a consistent pattern of weight gain and begins to integrate into a social environment."⁶

If an infant is unable to eat, sleep, or be consoled, the authors of this article then explore all the potential causes, as they would for any other newborn. Symptoms including fussiness, poor sleep, or feeding difficulties are not attributed to withdrawal alone because symptoms, like cluster feeding, are common newborn behaviors. Additionally, if NAS is indeed the cause of a symptom, opioids and other pharmacologic treatments may not be the appropriate next step in management. Infants experiencing NAS have increased caloric needs, up to 150 to 250 kcal/kg per day. For feeding difficulty or poor weight gain, the

optimization of nutrition through supplementation and fortification, lactation support, and speech and language pathology evaluation may all be more prudent initial responses than starting morphine. A third article in this edition of *Hospital Pediatrics* by Bogen et al¹⁰ highlights the importance of optimal nutrition in treating NAS. If an infant appears inconsolable, fully exploring other causes of discomfort and ensuring that caregivers can master soothing techniques will likely provide a longer-lasting benefit.

Five years ago, a commentary in this journal called for pediatric hospitalists to take the lead on NAS, including hospital system changes to facilitate rooming-in and promoting family-centered care for those battling substance use disorders.¹¹ As these articles demonstrate, we are making progress by contributing to the evidence base with both pragmatism and compassion. Looking ahead, we can promote consistent and supportive care environments for newborns and families both during hospitalization and at discharge. We can work with our primary-care colleagues and community services to standardize home nursing and early-intervention services and conduct rigorous evaluations of the developmental outcomes associated with different approaches to pharmacotherapy and non-NICU care settings. Through ongoing contributions in research and quality improvement, we can make substantial progress in the achievement of better care for opioid-exposed newborns.

REFERENCES

1. Patrick SW, Davis MM, Lehmann CU, Cooper WO. Increasing incidence and geographic distribution of neonatal abstinence syndrome: United States 2009 to 2012 [published correction appears in *J Perinatol*. 2015;35(8):667]. *J Perinatol*. 2015;35(8):650–655
2. Milliren C, Gupta M, Graham D, Melvin P, Jorina M, Ozonoff A. Hospital variation in neonatal abstinence syndrome incidence, treatment modalities, utilization and costs across pediatric hospitals in the United States,

- 2013–2016. *Hosp Pediatr*. 2018;8(1):e20170077
3. Finnegan LP, Kron RE, Connaughton JF, Emich JP. Assessment and treatment of abstinence in the infant of the drug-dependent mother. *Int J Clin Pharmacol Biopharm*. 1975;12(1–2):19–32
4. Cleveland LM, Bonugli R. Experiences of mothers of infants with neonatal abstinence syndrome in the neonatal intensive care unit. *J Obstet Gynecol Neonatal Nurs*. 2014;43(3):318–329
5. Atwood EC, Sollender G, Hsu E, et al. A qualitative study of family experience with hospitalization for neonatal abstinence syndrome. *Hosp Pediatr*. 2016;6(10):626–632
6. Hudak ML, Tan RC; Committee on Drugs; Committee on Fetus and Newborn; American Academy of Pediatrics. Neonatal drug withdrawal [published correction appears in *Pediatrics*. 2014; 133(5): 937]. *Pediatrics*. 2012;129(2). Available at: www.pediatrics.org/cgi/content/full/129/2/e540
7. Grossman MR, Berkwitz AK, Osborn RR, et al. An initiative to improve the quality of care of infants with neonatal abstinence syndrome. *Pediatrics*. 2017; 139(6):e20163360
8. Holmes AV, Atwood EC, Whalen B, et al. Rooming-in to treat neonatal abstinence syndrome: improved family-centered care at lower cost. *Pediatrics*. 2016; 137(6):e20152929
9. Grossman M, Lipshaw M, Osborn R, Berkwitz A. A novel approach to assessing infants with neonatal abstinence syndrome. *Hosp Pediatr*. 2018;8(1):e20170128
10. Bogen D, Hanusa B, Baker R, Medoff-Cooper B, Cohlan B. Randomized clinical trial of standard- vs high-calorie formula for methadone-exposed infants: a feasibility study. *Hosp Pediatr*. 2018;8(1):e20170114
11. Whalen BL, Holmes AV. Neonatal abstinence syndrome and the pediatric hospitalist. *Hosp Pediatr*. 2013;3(4):324–325

Neonatal Abstinence Syndrome and the Pediatric Hospitalist: 5 Years Later

Kathryn Dee L. MacMillan and Alison Volpe Holmes

Hospital Pediatrics 2018;8;51

DOI: 10.1542/hpeds.2017-0216 originally published online December 20, 2017;

Updated Information & Services	including high resolution figures, can be found at: http://hosppeds.aappublications.org/content/8/1/51
References	This article cites 10 articles, 4 of which you can access for free at: http://hosppeds.aappublications.org/content/8/1/51.full#ref-list-1
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): Fetus/Newborn Infant http://classic.hosppeds.aappublications.org/cgi/collection/fetus:newborn_infant_sub Hospital Medicine http://classic.hosppeds.aappublications.org/cgi/collection/hospital_medicine_sub
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: https://shop.aap.org/licensing-permissions/
Reprints	Information about ordering reprints can be found online: http://classic.hosppeds.aappublications.org/content/reprints



Neonatal Abstinence Syndrome and the Pediatric Hospitalist: 5 Years Later

Kathryn Dee L. MacMillan and Alison Volpe Holmes

Hospital Pediatrics 2018;8;51

DOI: 10.1542/hpeds.2017-0216 originally published online December 20, 2017;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://hosppeds.aappublications.org/content/8/1/51>

Hospital Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 2012. Hospital Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2018 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 2154-1663.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

