It Is Time to ACT NOW to Improve Quality for Opioid-Exposed Infants

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The opioid crisis continues to take a profound toll on communities across the United States. Opioid overdose deaths among adults are at record highs,[1] with each death representing countless more inpatient admissions and emergency department visits for an overdose that did not result in death. As complications of the opioid crisis spread in US communities, nurseries across the country also felt the impact of the crisis. Over the last 2 decades, the number of infants diagnosed with neonatal opioid withdrawal syndrome (NOWS), also known as neonatal abstinence syndrome, grew nearly eightfold, reaching 1 infant diagnosed every 15 minutes in the United States in 2016.[2,3] However, just as overdose deaths represent only a fraction of adults affected by the opioid crisis, diagnoses of NOWS represent a fraction of all opioid-exposed infants. Currently, there are no gold standard diagnostic criteria for NOWS nor validated quality measures for opioid-exposed infants. Thus, there remain substantial gaps in care delivered.

In this issue of *Pediatrics*, Young et al[4] present findings from a large cohort of infants treated at 30 hospitals participating in the ACT NOW (Advancing Clinical Trials in Neonatal Opioid Withdrawal Current Experience Study). The authors found profound variation in care for NOWS in every domain examined, including which units cared for these infants and breastfeeding rates. Strikingly, the proportion of infants requiring pharmacotherapy ranged from 6.7% to 100% and hospital mean length of stay ranged from 2 to 28.8 days between centers. Although the authors found hospital differences in study populations, it seems implausible that individual patient factors could account for this level of variation. It is apparent that 2 decades into the present opioid crisis, and despite countless state and national efforts to improve quality of care for opioid-exposed infants, one of our nation's most vulnerable populations is receiving highly variable care, resulting in disparate outcomes.

Although there has been substantial recent attention on the increasing number of infants diagnosed with NOWS, little attention has been paid to opioid-exposed infants who do not develop the syndrome. In previous studies of variations in care, authors focused only on NOWS[5] or on infants treated with pharmacotherapy.[6] In their study, Young et al[4] used a more expansive definition that identified opioid-exposed infants >36 weeks' gestation. All of these studies, however, are challenged by a lack of a gold standard definition for the opioid exposure and NOWS, which is exacerbated by relying on the availability of accurate medical record data and hospital coding. As a result, even the diagnosis of NOWS may vary by institution, with some institutions including any opioid-exposed infant, whereas others reserve the diagnosis for infants requiring pharmacotherapy. Understanding the entire population of opioid-exposed infants regardless of the appearance of signs of withdrawal is critical to optimizing outcomes because specific care processes

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themselves (eg, site of care, rooming in, and breastfeeding) may alter an infant's signs of withdrawal, and thus change the likelihood that an infant will meet an institution's threshold for a diagnosis of NOWS. At present, an institution's rate of NOWS depends on their care process and institutional definition of the syndrome. Standardizing clinical definitions of opioid exposure and NOWS is a critical first step to improving care for these infants.

In their 2001 report *Crossing the Quality Chasm: A New Health System for the 21st Century*, the Institute of Medicine defined quality care as safe, effective, patient-centered, timely, efficient, and equitable[7]; however, such a framework has yet to be rigorously applied to opioid-exposed infants. There are no systematically validated measures to assess the quality of care delivered by hospitals to this population.[8] In addition, there have been no studies used to examine key issues such as the usability of the measures for hospitals undertaking unit-specific quality improvement studies. Improving care for opioid-exposed infants must begin with defining and validating potential measures to assess hospital care practices and determining what aspect of quality a given measure assesses.[9]

For many years, the literature has demonstrated variability in care delivered to opioid-exposed infants and has proposed frameworks to address such variations[10]; however, there is no evidence of substantial improvement in care delivered to opioid-exposed infants. To achieve change, there must be a coordinated approach to incentivize high-quality care. Medicaid is financially responsible for the majority of opioid-exposed infants and those diagnosed with NOWS[11]; therefore, this federal-state program should lead the charge. Recently, the Center for Medicare and Medicaid Innovation implemented the Maternal Opioid Misuse Model, which aims to improve care for pregnant women for opioid use disorder. Although this is a positive step, the program nearly exclusively focuses on pregnant women, and results from the model will not be available for several years. It is time to ACT NOW to develop a gold standard definition for opioid-exposed infants and NOWS, assist in the development of evidence-based quality measures, and create systems that compensate providers for high-quality care.

ABBREVIATION

NOWS: neonatal opioid withdrawal syndrome

REFERENCES

1. Hedegaard H, Warner M, Miniño AM. Drug overdose deaths in the United States, 1999–2016. *NCHS Data Brief*. 2017;(294):1–8
2. Leech AA, Cooper WO, McNeer E, Scott TA, Patrick SW. Neonatal abstinence syndrome in the United States, 2004–16. *Health Aff (Millwood)*. 2020;39(5):764–767
3. Patrick SW, Schumacher RE, Benneyworth BD, Krans EE, McAllister JM, Davis MM. Neonatal abstinence syndrome and associated health care expenditures: United States, 2000–2009. *JAMA*. 2012;307(18):1934–1940
4. Young LW, Hu Z, Annett RD, et al. Site-level variation in the characteristics and care of infants with neonatal opioid withdrawal. *Pediatrics*. 2020;147(1): e2020008839
5. Patrick SW, Kaplan HC, Passarella M, Davis MM, Lorch SA. Variation in treatment of neonatal abstinence syndrome in US children's hospitals, 2004–2011. *J Perinatol*. 2014;34(11): 867–872
6. Patrick SW, Schumacher RE, Horbar JD, et al. Improving care for neonatal abstinence syndrome. *Pediatrics*. 2016; 137(5):e20153835
7. Institute of Medicine Committee on Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press; 2001
8. Lorch SA. National quality measures in perinatal medicine. *Clin Perinatol*. 2017; 44(3):485–509
9. Lorch SA. Quality measurements in pediatrics: what do they assess? *JAMA Pediatr*. 2013;167(1):89–90
10. Patrick SW. The triple aim for neonatal abstinence syndrome. *J Pediatr*. 2015; 167(6):1189–1191
11. Winkelman TNA, Villapiano N, Kozhimannil KB, Davis MM, Patrick SW. Incidence and costs of neonatal abstinence syndrome among infants with Medicaid: 2004–2014. *Pediatrics*. 2018;141(4):e20173520