



## Managing neonatal abstinence syndrome

### Issue:

Neonatal Abstinence Syndrome (NAS) is a drug withdrawal syndrome experienced shortly after birth by infants who were exposed in utero to opioids or other substances such as nicotine, or to medications used to treat maternal opioid use disorder such as methadone.<sup>1,2</sup> It also is known as Neonatal Opioid Withdrawal Syndrome<sup>3</sup> but will be referred to as NAS in this issue of *Quick Safety*.

As maternal opioid usage increases so does NAS; from 2000 to 2016, the incidence of NAS increased from 1.2 to 8.8 per 1000 hospital births.<sup>3</sup>

Symptoms of NAS include hyperirritability, excessive crying, poor sleep, poor feeding, diarrhea, hypertonia and tremors.<sup>1,2</sup> Other symptoms include sweating, sneezing, fever, yawning,<sup>3</sup> poor sucking reflex, and in some cases, seizures.<sup>2</sup>

### Evaluation and interventions

Currently, there is no gold standard of diagnostic criteria for NAS or validated quality measures, leaving gaps in care.<sup>4</sup> The onset of clinical signs of NAS varies depending on the type of substance and length of exposure and can vary from within 24 hours of birth to 5 days later.<sup>3</sup> There are several scoring systems to guide the diagnosis and treatment of NAS. The most commonly used tools in the U.S. are modified from the Finnegan scale. There is no one agreed-on scoring tool; each can be challenged for interrater reliability because each assesses clinical signs that can be subjective or related to the infant's adaptation to life outside the uterus.<sup>3</sup>

One modification to the Finnegan scale incorporates Maternal Opioid Treatment: Human Experimental Research (MOTHER) which considers clinical signs related to the central and autonomic nervous system as well as gastrointestinal signs.<sup>3</sup> This modification is useful when assessing pharmacotherapy initiation or weaning.<sup>3</sup>

The NICU Network Neurobehavioral Scale (NNNS) offers another evaluation approach based on direct handling of the infant and observation, with detailed descriptions of behavior, and is beneficial for improvement of nonpharmacological care.<sup>5</sup>

Another potential assessment tool is Eat, Sleep, Console (ESC), which examines the neonates' ability to eat or breastfeed well, sleep for at least an hour, and be consoled within 10 minutes.<sup>3</sup> Though this tool appears simple and easy to use, it has not been fully validated for long term safety and effectiveness.<sup>3</sup>

Practice guidelines recommend managing NAS both with clinical actions and nurse-driven interventions. Individualized nonpharmacologic care should be applied beginning at birth for all infants with substance exposure and continued throughout hospitalization and after.<sup>3</sup> Nonpharmacologic care may include various forms of supportive care; continuous supportive care may help avoid pharmacological interventions and may promote earlier discharge.<sup>2,3</sup>

Pharmacologic therapy should be considered for severe opioid withdrawal in addition to nonpharmacologic care.<sup>3</sup> Notably, delayed pharmacological therapy is associated with higher morbidity and longer length of hospital stay.<sup>6</sup> Protocol-based drug weaning has proven to reduce both opioid treatment duration and hospital stay length.<sup>6</sup> No single medication or regimen is considered suitable for every patient, and there are no standardized regimens for pharmacological management of NAS.<sup>6</sup> This is likely due to the varying drugs, doses, weights and gestational periods.<sup>6</sup>

(Cont.)



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The information in this publication is derived from actual events that occur in health care.

The use of nursing clinical practice guidelines for infants with NAS in a level IV NICU have been shown to result in increased identification of newborns with NAS, lessened NAS severity, and a decreased length of stay in the hospital.<sup>2</sup>

Ultimately, the goal is for NAS infants to stop showing signs of withdrawal, feed well, sleep well, gain weight and maintain stable withdrawal scores with little medication support, if possible. Literature supports a standardized, multidisciplinary approach combined with maternal participation in care of NAS newborns to achieve these objectives.<sup>6</sup>

### **Safety Actions to Consider:**

Hospitals can use the following actions to manage NAS and improve the care provided to babies who suffer from this condition, including:

- Adopt a standardized assessment approach by using a tool, such as a modified Finnegan scale, for infants at risk of NAS.<sup>3</sup>
- Identify maternal drug usage by reviewing records for prescription or illicit drug use, positive drug screens, and risky behavior.<sup>7</sup>
- Begin NAS assessment at birth for all newborns exposed to opioids or other substances.<sup>3</sup>
- If indicated, initiate the scoring tool within 24 hours of admission or after the infant is removed from short-term narcotics. Assess with the scoring tool every three to four hours.<sup>7</sup>
- Place the newborn in a quiet dark room with minimal disruptions, sleep protection, and pacifier use. Rooming in with the parent rather than the NICU may reduce NAS severity as the environment is likely to be more quiet.<sup>3</sup>
- Encourage self-calming efforts, skin to skin contact, and individualized caregiving.<sup>7</sup>
- Meet nutrition needs with on-demand feeding, avoid waking unless the baby is sick, and ensure adequate caloric intake to support growth with small frequent feedings of hypercaloric formula.<sup>7</sup>
- Ensure appropriate skin care for the infant, including protective barrier cream.<sup>7</sup>
- Educate parents early in the hospital stay about NAS and comfort strategies with positive reinforcement.<sup>7</sup>
- Determine guidelines for when to notify the medical team that pharmacologic decisions need to be made.<sup>7</sup>

Breastfeeding should be encouraged for HIV-negative mothers in opiate treatment programs if they have done the following:

- Consented to discuss progress in treatment.
- Agreed to postpartum treatment with a substance use disorder treatment counselor and the counselor agrees they were able to achieve sobriety prenatally.
- Have not had a relapse in at least 90 days.<sup>3</sup>
- Provided a negative urine toxicology test at delivery.
- Received consistent prenatal care.
- Confirmed that they are not taking medications that are contraindicated during lactation.

Breastfeeding is considered safe for patients who are on a stable methadone or buprenorphine regimen.<sup>3</sup> Mothers who are positive for hepatitis-C and have cracked or bleeding nipples should not breastfeed.<sup>3</sup> Patients who relapsed within the past 30 days or are actively using substances should not breastfeed.<sup>3</sup>

Other practice recommendations for NAS management include:

- Having a standardized scoring process and training to improve interrater reliability.<sup>3</sup> Standardized written treatment protocols for both nonpharmacologic and pharmacologic treatment of NAS is also recommended.<sup>3</sup>
- Educating the staff frequently on NAS and use of the selected scoring tool to maintain a consistent knowledge base. Protocols can reduce both length of stay and total duration of opioid treatment.<sup>7</sup>
- Discharging the infant after a minimum of 4 days, at least 24 hours after medication is discontinued, is recommended, with a pediatric follow-up appointment within 48 hours to monitor for weight gain and any further signs of withdrawal.<sup>3</sup> Incorporating into the discharge plan a social work assessment,

discussing community resources for the mother, and creating a plan for how the home environment will support the mother-baby couplet, up to and including an order for home services to check on the mother and baby outside of the facility.

**Resources:**

1. Patrick S, et al. Improving care for neonatal abstinence syndrome. *Pediatrics*. 2016;137(5)
  2. Tolia V, et al. Increasing incidence of the neonatal abstinence syndrome in U.S. neonatal ICUs. *The New England Journal of Medicine*. 2015;372(22)
  3. Patrick SW, Barfield WD, Poindexter BB, AAP Committee on Fetus and Newborn, Committee on Substance Use and Prevention. *Pediatrics*. 2020;146(5):e2020029074
  4. Patrick SW and Lorch SA. It is Time to ACT NOW to Improve Quality for Opioid-Exposed Infants. *Pediatrics*. 2021;147(1):e2020028340
  5. Chin Foo CA, Dansereau LM, Hawes K, et al. Improving the Assessment of Neonatal Abstinence Syndrome (NAS). *Children*. 2021, 8, 685. doi.org/10.3390/children8080685
  6. Hall E, et al. Implementation of a neonatal abstinence syndrome weaning protocol: A multicultural cohort study. *Pediatrics*. 2015;136(4)
  7. Casper T and Arbour M. Evidence-based nurse-driven interventions for the care of newborns with neonatal abstinence syndrome. *Advances in Neonatal Care*. 2014;14(6)
- Note: This is not an all-inclusive list.*