



# Dartmouth

## GEISEL SCHOOL OF MEDICINE

### Background

In recent years, the national incidence of Neonatal Opioid Withdrawal Syndrome (NOWS), also known as Neonatal Abstinence Syndrome (NAS), has increased significantly.<sup>1-6</sup> At the Children's Hospital at Dartmouth-Hitchcock (CHaD), one in 12 newborns are exposed to opioids in utero,<sup>7</sup> and rates in Northern New England are reported to be among the highest in the country.<sup>1, 8</sup> Traditional care of newborns with NOWS has utilized the Finnegan Neonatal Abstinence Scoring System (FNASS), a tool that tracks 21 different signs of neonatal opioid withdrawal to monitor the full spectrum of withdrawal and the response of infants to pharmacological treatment when initiated. While the FNASS remains the most commonly used assessment method for opioid-exposed newborns (OEN), a 2017 study performed by Bogen et al. found that wide variation exists across hospitals in implementation of the FNASS, including thresholds for pharmacological intervention.<sup>9</sup> Parents find score-based thresholds and provider inconsistencies in use of the FNASS anxiety-provoking,<sup>10, 11</sup> and providers have shared that the FNASS is "cumbersome" or "too complex for routine use in a busy clinical service."<sup>12, 13</sup> For these reasons, attempts to find shorter and simpler NOWS assessment approaches have been made.<sup>12, 14-19</sup> A novel function-based assessment and care method called the Eat Sleep Console (ESC) approach has emerged as a potentially simplified alternative to the FNASS to effectively and safely care for OEN.<sup>20</sup>

The ESC approach to assessing infants with NOWS originated at the Yale-New Haven Children's Hospital in conjunction with a five-year quality improvement (QI) initiative.<sup>20</sup> The ESC assessment focuses on three functions of a newborn to determine the extent to which withdrawal symptoms are impacting the newborn (i.e., the ability to eat, sleep, and be consoled). With this approach, non-pharmacologic care is maximized in an infant's clinical setting to reduce use of pharmacologic therapy. Yale's use of the ESC assessment approach, when paired with increased parental presence and a focus on non-pharmacologic care as first line treatment for NOWS, was associated with significant reductions in the rate of pharmacologic treatment of OEN from 98 to 14% and in hospital length of stay (LOS) from 22.4 to 5.9 days.<sup>20</sup>

While care of OEN using the ESC Care Tool appears to significantly improve in-hospital pharmacologic treatment rates and length of stay, there is currently no published data available on the experiences of nurses in caring for OEN using the ESC care approach including with use of ESC Care Tool.

# Nurse Experience Caring for Opioid-exposed Newborns using the Eat, Sleep, Console (ESC) Care Tool

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### Objectives

In this mixed methods qualitative and quantitative QI/research study, we aim to:

A. Explore the experiences of nurses caring for opioid exposed newborns (OEN) using the ESC Care Tool in three different inpatient clinical settings (Mother-Baby Unit, NICU/Special Care Nursery (SCN), Pediatrics Unit) within three academic hospitals and four non-academic community hospitals participating in the NNEPQIN ESC Care Tool QI initiative.

B. Identify variations and themes in nurses' experiences with the ESC Care Tool across varied levels of parental presence and involvement, rooming-in availability, maternal medication assisted treatment (MAT), and polysubstance exposure.

C. Inform ESC Care Tool hospital implementation strategies for hospitals newly exploring use of the ESC Care Tool for their care of OEN.

D. Serve as a pilot study for a nation-wide investigation of the nurse's experience caring for OEN using the ESC Care Tool for hospitals participating in a state ESC Care Tool PQC QI initiative or the ACT NOW clinical trial.

### Methods

Neonatal nurses from the seven identified NNEPQIN hospitals will be invited to participate in this study. Participating nurses will first respond to an online demographic survey to provide qualitative information. Next nurses will have an interview with a research assistant on their experiences with the ESC Care Tool. Interviews will be conducted using a qualitative interviewing guide. After being transcribed, the nurse interviews will be coded for thematic analysis. During this iterative process, the research team will categorize codes, identify consensually validated emerging themes, and append segments of dialogue to support proposed themes until conceptual saturation is reached. Following conceptual saturation, the research team will meet to propose and justify themes to develop a final shared set of major and minor themes.



EAT, SLEEP, CONSOLE (ESC) CARE TOOL ESC 3<sup>rd</sup> edition 1.30.20

- Review ESC behaviors, signs of withdrawal present, and Non-Pharm Care Interventions (NPIs) with parent(s) caregiver every 2-4 hours (using Newborn Care Diary), clustering care with infant's wakings and feedings. With each assessment, reinforce NPIs that parents/caregivers are implementing well ("K"), and educate ("E") co-parents in ways that other NPIs can be increased further ("I").
- If Yes for any ESC item or 3 for Consoling Support Needed: Perform a Formal Parent/Caregiver Huddle to formally review NPIs that can be optimized further to help with infant's current ESC difficulties and continue to monitor infant closely.
- If 2<sup>nd</sup> Yes in a row for any single ESC item (or 2<sup>nd</sup> -3<sup>rd</sup> for Consoling Support Needed) despite maximal non-pharm care OR other significant concerns are present (e.g., seizures, apnea): Perform a Full Care Team Huddle with parent/caregiver, infant RN and physician or associate provider to 1) consider all potential etiologies for symptoms, 2) re-assess if NPIs are maximized to fullest extent possible in infant's clinical setting, and 3) determine if Neonatal Opioid Withdrawal Syndrome (NOWS)/Neonatal Abstinence Syndrome (NAS) medication treatment is needed. Continue to maximize all NPIs and monitor infant closely.

Perform assessment of ESC behaviors, signs of withdrawal, and NPIs for time period since last ESC assessment – note date/time:	
<b>NOWS/NAS RISK ASSESSMENT</b>	
Are signs of withdrawal present? (e.g., hyperactive/moan, tremors/jitteriness, increased tone, excessive/disorganized suck) Yes / No	
If Yes, is timing of withdrawal consistent with known opioid exposure? Yes / No / Unsure	
Are co-exposures present that may be contributing to signs of withdrawal? Yes / No / Unsure (please list co-exposures)	
Are NPIs maximized to fullest extent possible in infant's clinical setting? Yes / No / Unsure	
<b>EATING</b>	
Takes > 10 min to coordinate feeding or breastfeeds < 10 min or feeds < 10 mL (or other age-appropriate duration/volume) due to NOWS/NAS? Yes / No	
<b>SLEEPING</b>	
Sleeps < 1 hr due to NOWS/NAS? Yes / No	
<b>CONSOLING</b>	
Takes > 10 min to console (or cannot stay consoled for at least 10 min) due to NOWS/NAS? Yes / No	
Consoling Support Needed	
1: Able to console on own	
2: Able to console within (and stay consoled) for 10 min with caregiver support	
3: Takes > 10 min to console (or cannot stay consoled for at least 10 min) despite caregiver's best efforts	
<b>CARE PLAN</b>	
Formal Parent/Caregiver Huddle Performed to formally review NPIs to be increased further? Yes / No	
Full Care Team Huddle Performed to formally consider all possible etiologies for symptoms, re-assess if NPIs are maximized to fullest extent possible, and determine if NOWS/NAS medication treatment is needed? Yes / No	
<b>Management Decision</b>	
a: Continue/Optimize NPIs	
b: Initiate NOWS/NAS Medication Treatment (e.g., if baby's symptoms & timing of symptoms are consistent with mother's particular opioid and NPIs are maximized to fullest extent possible in infant's clinical setting, OR other significant NOWS/NAS concerns are present (e.g., seizures, apnea)) – please list medication(s) initiated	
c: Continue NOWS/NAS Medication Treatment	
d: Other (please describe – e.g., Start 2 <sup>nd</sup> Pharmacologic Agent (indicate name), Wean or Discontinue Medication Treatment)	
<b>PARENT/CAREGIVER PRESENCE SINCE LAST ASSESSMENT</b>	
> 3 hours (includes if parent/caregiver present entire time), 2-3 hours, 1-2 hours, < 1 hour, 0 hours (no parent/caregiver present)	
<b>NON-PHARM CARE INTERVENTIONS (I = Incentive, R = Recline, E = Encourage or Recline, N = Not Applicable/Available)</b>	
Rooming-in (i.e., caring for infant in their own room with earlier caregiver response to infant stress or hunger cues)	
Parent/caregiver presence to help calm and care for infant	
Skin-to-skin contact when caregiver fully awake/alert to help organize infant feeding behaviors, calming & sleep	
Holding by parent/caregiver/cuddler to help calm infant & aid in sleep (with caregiver fully awake/alert)	
Safe & effective swaddling (e.g., extremities swaddled in flexed position, blanket snug, no extra blanket around baby's face)	
Optimal feeding (e.g., baby offered feedings when showing hunger cues & fed till content)	
Non-nutritive sucking with infant's hand, pacifier, adult caregiver's washed or gloved finger	
Quiet, low light environment to help limit overstimulation of infant (e.g., tv volume down, quiet "white noise" machine or phone app)	
Rhythmic movement provided by parent/caregiver or infant calming device (e.g., "jiggling" or infant swing in presence of alert adult)	
Additional help/support in room (e.g., other parent, family member, friend, cuddler, staff member, recovery coach, DCFY worker)	
Limiting # of visitors & duration of visits to minimize disruptions in infant's care environment & sleep	
Clustering care & assessments with infant's awake times (e.g., RN & infant provider perform assessment together after infant feedings)	
Safe sleep/fall prevention (e.g., infant sleeps on back, safely swaddled, in own sleep space)	
Parent/caregiver self-care & rest (e.g., identifying another adult to care for infant so parent can rest or take a walk/break)	
Optional Comments: (e.g., staff caring for/consoling baby as parents not available or able to safely care for baby)	

\*Special note: Numbers above are not intended as a "score" but instead may indicate/identify a need for increased intervention.

### References

1. Ho JY, Patrick SW, Tong YT, Patel R, Lind JN, Barfield WJ. Incidence of Neonatal Abstinence Syndrome – 28 States, 1999-2013. *MMWR*. 2016;65:799-802.
2. Villagano NG, Winkelman TNA, Kozhmannil KB, Davis MM, Patrick SW. Rural and Urban Differences in Neonatal Abstinence Syndrome and Maternal Opioid Use, 2004 to 2013. *JAMA Pediatr*. 2017;171:1134-1139.
3. Milliron CE, Gupta M, Graham DA, Melvin P, Jorling M, Oronoff A. Hospital Variation in Neonatal Abstinence Syndrome Incidence, Treatment Modalities, Resource Use, and Costs Across Pediatric Hospitals in the United States, 2013 to 2016. *Hosp Pediatr*. 2018;18:35-40.
4. Winkelman TNA, Villagano NG, Kozhmannil KB, Davis MM, Patrick SW, et al. Neonatal Abstinence Syndrome Incidence and Health Care Costs in the United States, 2016. *JAMA Pediatr*. 2019;173:141-147.
5. Strahan AE, Guy SP Jr, Bohn M, Frey M, Ko JY. Neonatal Abstinence Syndrome Incidence and Health Care Costs in the United States, 2016. *JAMA Pediatr*. 2019;174:200-202.
6. Ransiku A, Gonzalez-Mejias S, Joynt-Rita J. An Update on the Burden of Neonatal Abstinence Syndrome in the United States. *Hosp Pediatr*. 2020;10:133-134.
7. MacLellan KJ, Flanagan VA, Pincus J, Holmes AV, McCurdy A. Implementing the Eat Sleep Console (ESC) Care Tool for Neonatal Abstinence Syndrome in a Rural Tertiary Children's Hospital. In: *Proceedings from the 2019 Annual Meeting of the Pediatric Academic Societies*, Baltimore, MD.
8. ICMQR Fact Sheet: Healthcare Cost and Utilization Project (HCUP), September 2019 Agency for Healthcare Research and Quality, Rockville, MD. Available at: www.hcup-us.ahrq.gov/factsheets/hasmap.jsp?referrer=IP. Accessed on 07/20/20.
9. Regen DL, Whalen B, Bar JA, Vilgus M, King SA. Wide Variation Found in Care of Opioid-Exposed Newborns. *Acad Pediatr*. 2013;13:374-380.
10. Atwood EC, Schneider G, Vitek J, Aronow C, Flanagan V, Celentano J, Whalen B, Holmes AV. Qualitative Study of Family Experience With Hospitalization for Neonatal Abstinence Syndrome. *Hosp Pediatr*. 2016;66:626-632.
11. Cleveland LM, Peterson R. Experiences of mothers of infants with neonatal abstinence syndrome in the neonatal intensive care unit. *J Obstet Gynecol Neonatal Nurs*. 2004;43:318-329.
12. Zahrodny W, Rom C, Whitney W, Siddens S, Samuel M, Malchuk G, Marshall R. The neonatal withdrawal inventory: a simplified score of newborn withdrawal. *J Dev Behav Pediatr*. 1998;19:89-93.
13. American Academy of Pediatrics Committee on Drugs. Neonatal drug withdrawal. *Pediatrics*. 1996;101:1079-1088. [PubMed] correction appears in *Pediatrics*. 1996;101:1361-1364.
14. Jones HE, Sarsora C, O'Grady EC, Crocetti M, Katerndahl N, Whalen B. Neonatal abstinence score in opioid-exposed and nonexposed neonates – a blind comparison. *J Pediatr Manag*. 2010;6:409-413.
15. Maguire D, Cline GL, Parrel L, Tai CY. Validation of the Finnegan neonatal abstinence syndrome tool – short form. *Adv Neonatal Care*. 2013;12:430-437.
16. Jones HE, Seashore E, Johnson E, Horton E, O'Grady KE, Andringa K. Measurement of neonatal abstinence syndrome: Evaluation of short forms. *J Obstet Manag*. 2016;12:19-23.
17. Gomez Pomar F, Finnigan JP, Devlin L, Bada H, Conzina VA, Isonis KT, Westgate PM. Simplification of the Finnegan Neonatal Abstinence Scoring System: retrospective study of two institutions in the USA. *BMJ Open*. 2017;21:e015419.
18. Devlin LA, Breece JL, Terrell N, Gomez Pomar F, Bada H, Finnigan JP, O'Grady KE, Jones HE, Lester B, Davis JM. Association of a Simplified Finnegan Neonatal Abstinence Scoring Tool With the Need for Pharmacologic Treatment for Neonatal Abstinence Syndrome. *JAMA Netw Open*. 2020;3:e202276.
19. Hochstetler P, Qian EC, Mandru C, Vilar RE, Alpan G, La Gamma EF. A New Scoring System for the Assessment of Neonatal Abstinence Syndrome. *Am J Perinatol*. 2020;37:333-340.
20. Grossman MK, Berkwitt AJ, Osborn RR, Xu J, Esserman DA, Shapiro ED, Bizzarro MJ. An Initiative to Improve the Quality of Care of Infants with Neonatal Abstinence Syndrome. *Pediatrics*. 2017;139:e2016360.