Literature Review

Current Trends in Care for Infants Diagnosed with Neonatal Abstinence Syndrome in Canada: A Discussion Paper

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Abstract

Introduction: Neonatal abstinence syndrome (NAS) is a growing epidemic across the globe. Infants diagnosed often require resource-intensive nursing care and are at risk for future complex health conditions. A shift in approaches to care for this population has been identified as a priority health care need across Canada. **Objectives:** This discussion paper aims to highlight the current shift in care for the NAS population, focusing on the Finnegan Neonatal Abstinence Scoring Tool (FNAST) and the Eat, Sleep, Console (ESC) model of care. **Methods:** A comprehensive search strategy was developed to explore the current trend in care for infants diagnosed with NAS: the transition from the FNAST to the ESC model of care. Four scholarly databases (CINAHL, PubMed, Cochrane, and Google Scholar) were searched. Relevant articles were critically analyzed for their implications on infant and family health, family experience, health system outcomes, and nursing practice. **Discussion:** In our review of the literature, the FNAST was the most used tool when caring for infants diagnosed with NAS. Although this tool has guided care for infants for decades, it presents some limitations, including subjectivity, invasive and lengthy assessments, and lack of collaboration. Many facilities across Canada are shifting to the ESC model of care as an alternative model. It has potential to address challenges of the care guided by the FNAST, with the ESC model emphasizing non-pharmacological care, a focus on the birth-parent–infant dyad, and dedication to a function-based assessment. **Conclusion:** Further efforts are needed to support the real-world implementation of evidence-based models of care for this population.

Keywords: Eat, Sleep, Console (ESC); Finnegan Neonatal Abstinence Scoring Tool (FNAST); Neonatal abstinence syndrome (NAS); Perinatal nursing care

Introduction

Neonatal abstinence syndrome (NAS) is a condition in infants, most often characterized by symptoms related to withdrawal from opioids exposed to them in utero (Anbalagan & Mendez, 2023; Dodds et al., 2019). Symptoms of NAS vary and are often individualized to the infant depending on interrelated factors such as type of maternal drug use, exposure length, and gestational age (Lacaze-Masmonteil & O'Flaherty, 2018). Clinical presentations may include irritability, poor feeding, hypertonia, changes in sleep, and tremors (Anbalagan & Mendez, 2023). NAS is a growing epidemic

internationally (Anbalagan & Mendez, 2023; Patrick et al., 2016). The first case of NAS was diagnosed in 1875; however, in present times the incidence of NAS has grown substantially over the past decade (Gomez-Pomar & Finnegan, 2018). Between 2016 and 2017, in Canada, approximately 0.51% of all infants were diagnosed with NAS (Lacaze-Masmonteil & O'Flaherty, 2018). Similar findings have been reported in the United States, where there was an observed 82% increase from 2010 to 2017 in NAS incidence rates (Centers for Disease Control and Prevention, 2023; Hirai et al., 2021).

Increased NAS incidence rates create significant implications for the health care system (Anbalagan & Mendez, 2023; Filteau et al., 2018). For example, the cost of a hospital stay for an infant with NAS is approximately seven times that of an infant without NAS (Centers for Disease Control and Prevention, 2023). In Canada, total costs of health care services to care for infants diagnosed with NAS nearly doubled between 2010 to 2014, from $15.7 to $26.9 million dollars respectively (Filteau et al., 2018). This cost is largely due to the increased length of hospital stay required to treat infants with NAS, with an average stay of 15 days (Filteau et al., 2018; Winkelman et al., 2018).

Registered nurses are the frontline providers tasked with caring for infants who present with NAS. This requires completing frequent assessments, providing non-pharmacological support, and delivering pharmacological management (Clark, 2019; Timpson et al., 2018). Infants diagnosed with NAS were once strictly cared for in a neonatal intensive care unit (NICU; Anbalagan & Mendez, 2023). However, with emerging evidence on the importance of the birth-parent–infant dyad, there has been a shift in nursing practice from a standard NICU admission to standardizing admissions in postpartum maternity settings (Anbalagan & Mendez, 2023).

Recent reviews reported that infants are often treated with pharmacological management, rather than the use of non-pharmacological interventions (Wachman et al., 2018). This increase in pharmacological management has implications. It has been shown to prolong length of hospital stays for infants with NAS and to lack the involvement of families in the care for their children (Wachman et al., 2018). Evidence shows that individualized NAS care can be accomplished by focusing on the birth-parent–infant dyad to optimize non-pharmacological management delivered by the birth parent and thus increasing familial collaboration (Anbalagan & Mendez, 2023). The birth parents of babies with NAS have unique health concerns and challenges that need to be addressed using a multi-level approach, including dedication to the physical, emotional, mental, and spiritual well-being (Anbalagan & Mendez, 2023). The well-being of the birth parent is imperative to the infant's care, as they are the first line of treatment for their infant during withdrawal (Anbalagan & Mendez, 2023; Blount et al., 2019; Dodds et al., 2019). Specifically, non-pharmacological strategies delivered by the birth parent such as skin-to-skin, breastfeeding, swaddling and increased birth-parent–infant dyad support have been cited in the literature to assist in the treatment of withdrawal symptoms in infants diagnosed with NAS (Bagley et al., 2014; Knopf, 2017; Pahl et al., 2020). In unique cases, such as those involving incarcerated individuals, studies continued to show positive outcomes when the birth-parent–infant dyad was preserved (Drago et al., 2022). A primary caregiver should be determined in cases where the birth parent is unable to provide care. A designated caregiver will ensure seamless engagement in responsive, newborn-centred care (Perinatal Services BC, 2020).

Despite ample evidence in the literature regarding the etiology of NAS and the importance of the birth parent's central role in treatment, it is unclear whether this translates to current nursing practices (Blount et al., 2019; Dodds et al., 2019). Families echo this sentiment as they often report not being actively engaged in family-provider partnerships. This lack of collaboration results from institutional barriers such as stigma, restrictive assessment tools, and lack of transparency in care (Rockefeller et al., 2019). Birth parents who have a supportive environment in which to bond with their infants

and who are involved in their infant's care plan have been shown to experience improved health outcomes such as better adherence to maintenance therapy, increased self-care activities, and more ready adjustment to a parental role (Rockefeller et al., 2019).

In response to the growing needs of the NAS population, as identified by patients and care providers, efforts have been made to improve patient and health system outcomes by addressing the current health care trends in NAS care. Historically, the most widely used tool to guide the care for infants with NAS has been the Finnegan Neonatal Abstinence Scoring Tool (FNAST; Chin Foo et al., 2021; Schiff & Grossman, 2019; Verklan, 2019). However, there has been a recent shift in provincial and national perinatal care facilities toward a novel approach titled the Eat, Sleep, Console (ESC) model of care (British Columbia Centre on Substance Use et al., 2018). As such, the aim of this discussion paper is to highlight the current shift in care for the NAS population, focusing on the FNAST and ESC model of care. This discussion article will highlight the strengths and weaknesses of the FNAST and the ESC model, along with examining the shift in approaches and exploring implications for nursing practice.

Methods

A preliminary search identified the current shift in nursing practice as moving from an assessment tool to a model of care in order to improve patient and health system outcomes for the NAS population. Literature highlighted that the FNAST was previously recognized as the "gold standard" for clinical and nursing practice, while the ESC model is a novel approach emerging in response to criticisms of the FNAST (Anbalagan & Mendez, 2023). As such, we developed a comprehensive search strategy to explore this current shift in nursing practice, focusing on the FNAST and ESC model of care.

The search strategy included reviewing four scholarly databases (CINAHL, PubMed, Cochrane, and Google Scholar) for relevant articles. Additional articles were identified through hand-searching the reference lists of key articles. Keywords included the following: experience; mother*; ESC; eat, sleep, console; Finnegan Neonatal Abstinence Scoring Tool; FNAST; neonatal abstinence syndrome; neonatal withdrawal syndrome; NAS; neonatal abstinence; and neonatal withdrawal, with Boolean operators applied as needed. We limited articles to only those written in the English language, as authors were able to critically analyze only English-language articles. Eligibility criteria included any study designs presenting original research or discussion related to care for infants with NAS, explorations of the FNAST and ESC model of care, and discursive articles on the FNAST. Relevant articles were then retrieved and critically analyzed by the lead author (S. M. Gallant), who is a perinatal registered nurse experienced with caring for the NAS population. The articles were analyzed for relevance to nursing practice, impacts of experience and health outcomes for infants and families, and health care system outcomes.

Discussion

The following section provides a synthesis of literature exploring the current shift from the FNAST to the ESC model of care. We begin by describing the strengths and limitations of the FNAST and the ESC model of care. We then explore how shifting from an assessment tool to a model of care has been shown to improve patient and health system outcomes, and provide implications of this discussion for nursing practice.

Finnegan Neonatal Abstinence Scoring Tool (FNAST)

The FNAST, or a modified version of such, was identified as the most widely used assessment tool in caring for infants with NAS (Chin Foo et al., 2021; Schiff & Grossman, 2019; Verklan, 2019). The FNAST was developed in 1974 and contains a scoring system based on common opioid withdrawal symptoms that an infant with NAS may experience (Wachman et

al., 2018). Scoring is assessed by the primary nurse and is completed based on both nurse and family observations every three to four hours in the infant's room (Anbalagan & Mendez, 2023). The first version of this tool was developed to provide an objective measurement and assessment of symptoms experienced by an infant born with NAS (Finnegan et al., 1975).

Strengths

The FNAST was originally developed for standardized evaluation of neonatal withdrawal symptoms in research settings and was not intended to be used as a clinical assessment tool in clinical practice (Verklan, 2019). However, it was quickly adopted into nursing practice and was paramount in the 1970s when no formal assessments were available to provide guidance to health care providers on the care of the NAS infant population (Zimmermann-Baer et al., 2010). As nursing practices have changed over the years, so has the FNAST, leading to a variety of modified versions used by subsequent researchers and clinical providers in response to changing clinical needs and emerging research (Anbalagan & Mendez, 2023; Zimmermann-Baer et al., 2010). In addition, the concept of substance use in pregnancy has also evolved over the years, requiring drastic changes in assessment due to the increased complexities of substance use (Verklan, 2019). Despite these practice changes, the FNAST remains the most used tool to assess infants diagnosed with NAS (Gomez-Pomar & Finnegan, 2018). The FNAST provides the ability for nurses to quantify assessments, thus managing the treatment of pharmacological management for infants diagnosed with NAS (Kocherlakota, 2014). The score also represents the time leading up to the assessment inclusive of the assessment, reflecting the symptoms of the infants over time (Kocherlakota, 2014).

Limitations

Following a synthesis and critique of current literature, three key reported limitations of the FNAST were identified:

subjectivity, invasive and lengthy assessment, and lack of collaboration with the family.

Subjectivity

The level of subjectivity in the tool has been questioned by registered nurses and birth parents due to the nature of the characteristics being assessed (Chin Foo et al., 2021; Rockefeller et al., 2019). For example, items on the assessment list have potentially low clinical significance, such as sneezing or yawning (Anbalagan & Mendez, 2023; Verklan, 2019). Additionally, the lack of consistency in how items are being assessed has created many challenges in caring for infants with NAS. For example, infants may not be receiving consistent care measures and interventions due to the variability of observations from one observer to the next (Rockefeller et al., 2019). Unfortunately, no standardized training program is established to guide the use of the FNAST (Verklan, 2019). With high turnover rates of nursing staff in the maternity setting, inexperienced nurses without adequate training in the FNAST may be responsible for caring for infants diagnosed with NAS (Lavoie-Tremblay et al., 2019). Without adequate training, assessments are at risk of being rushed or inappropriately completed, leading to a potential for underscoring or overscoring infants and initiating a misguided care plan (Nayeri et al., 2017). However, it is important to note that even with training on the FNAST, previous research has shown that nurses may not be accurately and consistently applying scoring measures (Clark, 2019). Therefore, infants are at risk of being treated based on inaccurate or incorrect assessments (Clark, 2019; Timpson et al., 2018). Feedback from nurses using this scoring system echo these findings, sharing that the FNAST does not always identify symptoms of NAS appropriately, and the subjectivity of the assessment items can impact the clinical care being provided (Chin Foo et al., 2021).

Invasive and Lengthy Assessment

The FNAST has been critiqued for its invasive and lengthy assessment process (Anbalagan & Mendez, 2023). Items listed on

the assessment require the infant to be stimulated in order to accurately assess multiple criteria (Anbalagan & Mendez, 2023; Grossman, Osborn, & Berkwitt, 2017; Holmes et al., 2016; Singh & Davis, 2021). For example, the tool requires nurses to disturb the infant to assess their autonomic nervous system (e.g., tremors, posture). However, it can become unclear whether the infant is demonstrating symptoms simply in response to the nurse's assessment measures or from withdrawal itself (Grossman, Osborn, & Berkwitt, 2017; Schiff & Grossman, 2019).

In recent years, researchers have identified challenges with the lengthiness of the tool (Curran et al., 2020; Nayeri et al., 2017; Schiff & Grossman, 2019; Singh & Davis, 2021). For example, an infant needs to be disturbed every three hours to determine the presence of a hyper-Moro reflex or tremors (Verklan, 2019). Further, Zimmermann-Baer and colleagues suggest that there are some criteria listed on the 21-item scoring form that do not necessarily reflect symptoms of withdrawal (Whalen et al., 2019; Zimmermann-Baer et al., 2010). A simplified version, with eight to 10 criteria, has shown to be comparably effective (Anbalagan & Mendez, 2023; Curran et al., 2020).

Lack of Collaboration with the Family

Infants diagnosed with NAS often come from families with complex social dynamics that may be overlooked during the assessment of infants diagnosed with NAS (Carlson & Kieran, 2019). Birth parents are instrumental in the care of their infant during withdrawal, often sharing their desire to be involved and to have consistency in their infant's care (Dodds et al., 2019; Hein et al., 2021; Miller & Willier, 2021; Rockefeller et al., 2019; Wachman et al., 2018). The varied consistency and accuracy of the FNAST has led to birth parents feeling a poor sense of collaboration and lack of consistency in their infant's care (Rockefeller et al., 2019). The disruption that occurs from each assessment component interrupts the natural rhythm of the birth-parent–infant dyad and can create a disrupted discourse between nurses and birth parents (Rockefeller et al., 2019; Whalen et al.,

2019). The FNAST is situated in an older biomedical model of treating the infant as an individual, rather than as part of a family unit, and therefore indirectly removes the birth parent from important care decisions (Byrne et al., 2018).

Eat, Sleep, Console (ESC) Model

Many novel approaches to care have been developed to attend to the current gaps of the FNAST. The Eat, Sleep, Console (ESC) model of care was identified in recent research to address the reported challenges with the FNAST (Grossman, Osborn, & Berkwitt, 2017). The ESC model of care includes a scoring system intended to be supportive in nature and empower collaboration between team members across the care continuum (Anbalagan & Mendez, 2023; Blount et al., 2019; Schiff & Grossman, 2019).

The ESC model was developed in 2017 at Yale New Haven Children's Hospital by Dr. Grossman and colleagues in response to years of observation and care of infants with NAS (Grossman et al., 2018). The importance of eating, sleeping, and using a non-invasive approach were noted as critical tenants of the ESC model (Grossman et al., 2018). Further, the model was developed through multiple plan-do-study-act studies exploring function-based assessments of babies diagnosed with NAS (Grossman, Berkwitt, et al., 2017). These studies showed improved outcomes for infants, including decreased length of hospital stay, decreased need for pharmacological treatment, and increased use of non-pharmacological interventions (Grossman, Berkwitt, et al., 2017; Grossman, Osborn, & Berkwitt, 2017; Holmes et al., 2016). The ESC model encompasses a scoring tool, the ESC tool, to guide assessments; however, instead of being symptom-focused like FNAST, it is function-focused specifically on eating, sleeping, and consoling of the newborn (Schiff & Grossman, 2019; Wachman et al., 2017). The eating and sleeping categories make use of a dichotomized yes or no assessment, while the consoling section is scored on a scale from one to three (Wachman et al., 2017).

Strengths of the ESC Model

The ESC model has various strengths, as it was carefully designed to mitigate the challenges of the FNAST currently used in most health facilities (Grossman, Osborn, & Berkwitt, 2017). The ESC model is focused on non-pharmacological treatment as a first-line response for infants diagnosed with NAS. By concentrating on non-pharmacological care such as skin-to-skin, swaddling, and non-nutritive sucking, there is a decrease in the need for pharmacological interventions (Wachman et al., 2017). With a well-being focus, babies' needs are treated quicker. For example, when babies have reached 10 minutes of being inconsolable, a huddle with the multidisciplinary care team—including parents—is initiated to identify further interventions (Schiff & Grossman, 2019).

The ESC model of care is founded in collaborative clinical practice, supporting an empowering environment for birth parents and/or primary caregivers (National Institute for Children's Health Quality, 2019). The ESC model designates the birth parent as the primary treatment method by putting an emphasis on non-pharmacological management techniques initiated by the birth parent and involving the care team in decision-making (Anbalagan & Mendez, 2023; Blount et al., 2019; National Institute for Children's Health Quality, 2019; Schiff & Grossman, 2019). Empowering the birth-parent–infant dyad encourages confidence and involvement of the birth parent in their infant's care. Further, providing education and encouragement to help birth parents be actively involved in health-care team huddles can contribute to a positive care environment (Miller & Willier, 2021; National Institute for Children's Health Quality, 2019).

The ESC model has been shown to decrease hospital stays for infants with NAS and their families (Blount et al., 2019; Dodds et al., 2019; Grisham et al., 2019; Parlaman et al., 2019). The model of care supports families in achieving early independence and strengthening their abilities to care for their infant at home (National Institute for Children's Health Quality, 2019). The ESC model of care promotes intuitive assessments that are easy to understand and use by both health care providers and family members (Grossman et al., 2018). Having a collaborative environment for caregivers to learn about their infant's care can promote confidence and bonding, further supporting a smooth transition from hospital to the home (National Institute for Children's Health Quality, 2019).

Limitations of the ESC Model

In the evaluation of the ESC scoring system, a relatively low inter-rater reliability between health care providers was noted in the categories of sleeping and soothing supports (Schiff & Grossman, 2019). Nursing scoring tools have historically been used to guide clinical practice and assessment, with clinical judgment providing the ultimate decision (Curran et al., 2020). Although limited evaluation has been completed exploring the inter- and intra-reliability of the ESC scoring tool, preliminary evaluations demonstrate high inter-rater reliability in communicating the need for a huddle (Schiff & Grossman, 2019). With the increased collaboration and frequent huddles with the ESC model, there is more room for clinical judgment to arise through discussion, and thus clinical judgment may be a possible reason for the discrepancies in inter-rater reliability (Curran et al., 2020; Ponder et al., 2021).

The ESC model has also been criticized for its lack of independent implementation as a single intervention without additional supportive measures. To date, the ESC model has been primarily implemented in combination with several other family-centred initiatives (e.g., increased breastfeeding support; Schiff & Grossman, 2019). As such, there have been questions regarding which interventions and key components are influencing the observed positive outcomes (Schiff & Grossman, 2019). While the ESC model is grounded in collaborative practices, and as such supports the use of various supportive family-centred interventions, its frequent implementation as a part of a multi-pronged strategy has made it difficult to discern which actions are influencing what change (Schiff & Grossman, 2019).

## A Transition from a Tool to a Model of Care

It is important to recognize that a direct comparison of the FNAST to the ESC model of care is not possible, as the FNAST represents a tool guiding a care approach, in contrast to the ESC model, which represents a philosophy of care that encompasses an assessment tool (Schiff & Grossman, 2019). The FNAST was developed for use in a biomedical approach to care (Byrne et al., 2018), whereas the ESC scoring tool was developed within the ESC model of care, which was founded on the concepts of collaboration and non-pharmacological approaches to care (Schiff &

Grossman, 2019). As such, the below discussion highlights how transitioning from a specific tool to an evidence-based model of care has contributed to improve patient and health system outcomes. Figure 1 demonstrates this current trend in NAS care, highlighting the impact of an evidence-based model of care on patient and health system outcomes.

In response to the introduction of the ESC model into clinical and nursing practice, several studies have assessed the effects of the model on health care system outcomes (Blount et al., 2019; Dodds et al., 2019; Grisham et al., 2019; Grossman et al., 2018; Hein et al., 2021; Miller & Willier, 2021; Parlaman et al., 2019).

Figure 1

Demonstrating Current Challenges and Improvements in Care Trends for Infants with NAS
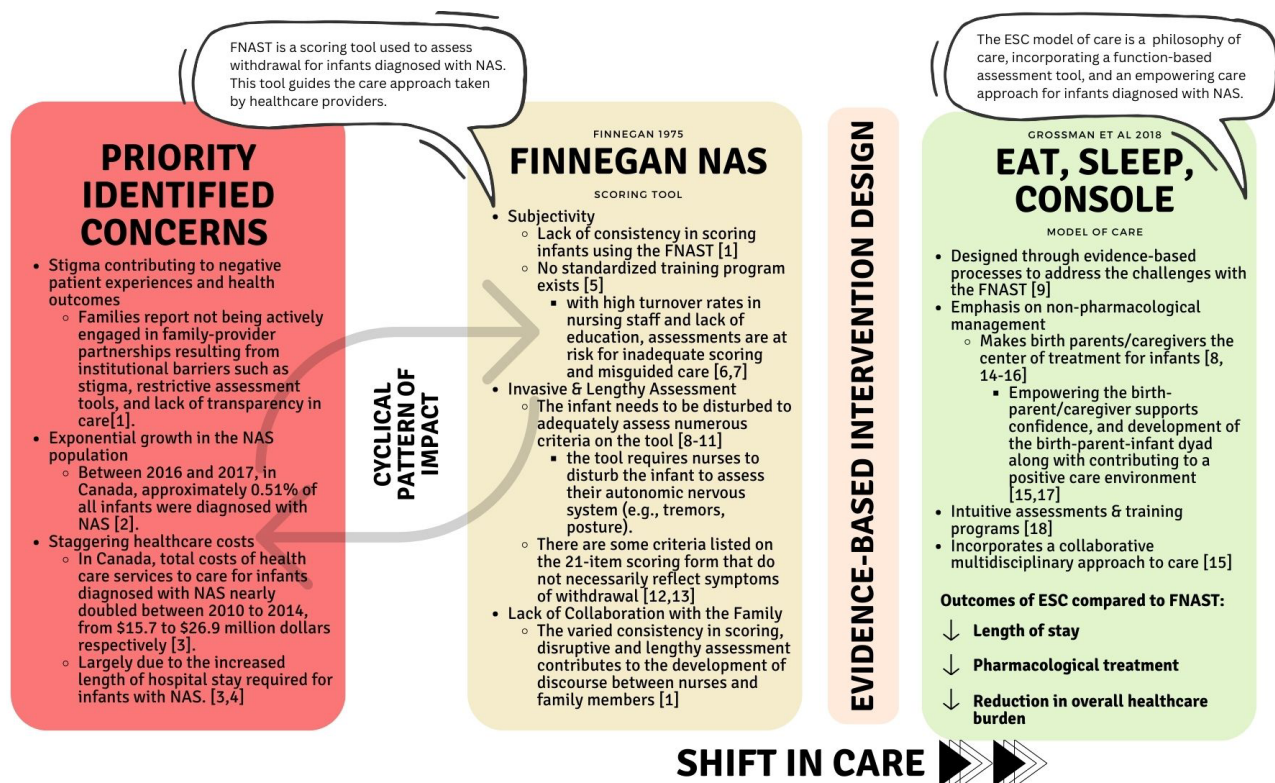
Note. References of Figure 1 are as follows: [1] Rockefeller et al., 2019; [2] Lacaze-Masmonteil & O'Flaherty, 2018; [3] Filteau et al., 2018; [4] Winkelman et al., 2018; [5] Verklan, 2019; [6] Lavoie-Tremblay et al., 2019; [7] Nayeri et al., 2017; [8] Anbalagan & Mendez, 2023; [9] Grossman, Osborn, & Berkwitt, 2017; [10] Holmes et al., 2016; [11] Singh & Davis, 2021; [12] Whalen et al., 2019; [13] Zimmermann-Baer et al., 2010; [14] Blount et al., 2019; [15] National Institute for Children's Health Quality, 2019; [16] Schiff & Grossman, 2019; [17] Miller & Willier, 2021; and [18] Grossman et al., 2018.

Grossman and colleagues (2018) evaluated the ESC model over a five-year quality improvement study to determine the ESC model's effectiveness in nursing practice compared to the FNAST. Overall, the introduction of the ESC model of care decreased the average length of stay from 23 days to six days. Similarly, several research studies have demonstrated that the ESC model can lead to a reduction in the overall burden on the health care system by decreasing average length of hospital stay (Blount et al., 2019; Dodds et al., 2019; Grisham et al., 2019; Parlaman et al., 2019).

When exploring the shift in nursing practice from the FNAST to the ESC model of care, Grossman and colleagues (2018) found that pharmacological interventions using opioid treatment for infants diagnosed with NAS decreased from 98% to 12%. Further, previous research has shown that infants who need pharmacological treatment are still being accurately identified with the ESC model (Curran et al., 2020). Several studies have reported this decrease in pharmacological treatment in a range of practice settings, including tertiary and community hospitals (Blount et al., 2019; Dodds et al., 2019; Parlaman et al., 2019). The increase in non-pharmacological treatment for NAS under the ESC model has been shown to improve infants' withdrawal symptoms and strengthen birth-parent–infant bonding (Whalen et al., 2019). Further, the implementation of the ESC model in comparison to the FNAST did not lead to increased adverse outcomes or undertreatment of infants (Grossman et al., 2018; Miller & Willier, 2021; Parlaman et al., 2019). It is important to note that for the FNAST and ESC model of care, further research is needed to determine long-term outcomes for infants being managed with these two approaches (Grisham et al., 2019; Verklan, 2019). Additionally, there is a need for future research to elicit experiences of nurses and birth parents using the ESC in nursing practice, as limited research exists.

Considerations for Clinical Practice

The emerging evidence supports the implementation of the ESC model of care into nursing practice, as it has been shown to decrease length of stay and reduce the need for pharmacological treatment (Blount et al., 2019; Dodds et al., 2019; Grisham et al., 2019; Grossman et al., 2018; Parlaman et al., 2019). Two promising implementation strategies for integrating the ESC model of care into nursing practice include ongoing education programs and standardized templates (Asti et al., 2015; Parlaman et al., 2019; Wachman et al., 2018). Specifically, ongoing education, along with supportive monthly check-ins, contributed to sustained results after 12 months of intervention and empowered a culture shift among health care providers (Parlaman et al., 2019; Wachman et al., 2018). In addition, standardized protocols, guidelines, and documentation flow sheets provide structure and guidance in implementing the ESC model (Parlaman et al., 2019; Wachman et al., 2018). In Canada, the British Columbia provincial health system exemplifies these findings through their dedication to resources supporting the shift in care for infants diagnosed with NAS to the ESC model of care. For example, in a 2022 provincial evaluation report, training modules were noted to be instrumental in the successful uptake of the ESC model in clinical practice (Nota Bene Consulting Group et al., 2022). Nurses and health system leaders may consider these strategies when planning the implementation of ESC into nursing practice. Future research efforts are needed to support implementation and sustainability of the ESC model to improve outcomes for infants diagnosed with NAS.

Conclusion

NAS is a growing epidemic internationally, creating implications for both the health care system and nurses who care for infants with NAS and their families. Historically, the most widely used tool to guide the care for infants with NAS has been the Finnegan Neonatal Abstinence Scoring Tool (FNAST); however, there has been a recent shift to a novel approach titled the Eat, Sleep, Console (ESC)

model of care. This discussion highlighted strengths and weaknesses of the FNAST, demonstrating the downfalls of using a biomedical tool to guide nursing practice to address unique needs in a marginalized population. Shifting from a tool toward a model and philosophy of care, specifically the ESC model, shows promising positive outcomes such as decreased pharmacological treatment, a reduction in length of hospital stay, and improvement in overall care for infants diagnosed with NAS and their families.

Ethical Approval

Not required.

Conflicts of Interest

No conflicts of interest to declare.

References

Anbalagan, S., & Mendez, M. D. (2023, March 6). Neonatal abstinence syndrome. In *StatPearls*. StatPearls Publishing. Retrieved April 1, 2023, from https://www.ncbi.nlm.nih.gov/books/NBK551498/

Asti, L., Magers, J. S., Keels, E., Wispe, J., & McClead, R. E., Jr. (2015). A quality improvement project to reduce length of stay for neonatal abstinence syndrome. *Pediatrics*, *135*(6), e1494–e1500. https://doi.org/10.1542/peds.2014-1269

Bagley, S. M., Wachman, E. M., Holland, E., & Brogly, S. B. (2014). Review of the assessment and management of neonatal abstinence syndrome. *Addiction Science & Clinical Practice*, *9*, Article 19. https://doi.org/10.1186/1940-0640-9-19

Blount, T., Painter, A., Freeman, E., Grossman, M., & Sutton, A. G. (2019). Reduction in length of stay and morphine use for NAS with the "Eat, Sleep, Console" method. *Hospital Pediatrics*, *9*(8), 615–623.

https://doi.org/10.1542/hpeds.2018-0238

British Columbia Centre on Substance Use, B.C. Ministry of Health, B.C. Ministry of Mental Health and Addictions, & Perinatal Services BC. (2018, June 1). *Treatment of opioid use disorder during pregnancy—Guideline supplement.* https://www.bccsu.ca/wp-content/uploads/2018/06/OUD-Pregnancy.pdf

Byrne, P. J., Foss, K., Clarke, D., Wismark, J., & Cardinal, K. (2018). Whole-family treatment of neonatal abstinence syndrome. *Canadian Medical Association Journal*, *190*(15), E477–E478. https://doi.org/10.1503/cmaj.69170

Carlson, K., & Kieran, K. (2019). Narratives of neonatal abstinence syndrome. *Archives of Psychiatric Nursing*, *33*(3), 275–283. https://doi.org/10.1016/j.apnu.2019.01.011

Centers for Disease Control and Prevention. (2023, March 21). *Data and statistics about opioid use during pregnancy*. Retrieved April 1, 2023, from https://www.cdc.gov/pregnancy/opioids/data.html

Chin Foo, C. A., Dansereau, L. M., Hawes, K., Oliveira, E. L., & Lester, B. M. (2021). Improving the assessment of neonatal abstinence syndrome (NAS). *Children*, *8*(8), Article 685. https://doi.org/10.3390/children8080685

Clark, A. F. (2019). Effect of a neonatal abstinence syndrome training program on nurses' confidence and ability to use the Finnegan Scoring Tool. *Nursing for Women's Health*, *23*(6), 485–493. https://doi.org/10.1016/j.nwh.2019.09.005

Curran, M., Holt, C., Arciero, M., Quinlan, J., Cox, D., & Craig, A. (2020). Proxy Finnegan component scores for Eat, Sleep, Console in a cohort of opioid-exposed neonates. *Hospital Pediatrics*, *10*(12), 1053–1058. https://doi.org/10.1542/hpeds.2020-0190

Dodds, D., Koch, K., Buitrago-Mogollon, T., & Horstmann, S. (2019). Successful implementation of the Eat Sleep Console model of care for infants with NAS in a community hospital. *Hospital Pediatrics*, *9*(8), 632–638. https://doi.org/10.1542/hpeds.2019-0086

Drago, M. J., Shabanova, V., Hochreiter, D., Grossman, M., & Mercurio, M. (2022). Does maternal incarceration impact infants with neonatal abstinence syndrome? *Maternal and Child Health Journal*, *26*(5), 1095–1103. https://doi.org/10.1007/s10995-021-03356-4

Filteau, J., Coo, H., & Dow, K. (2018). Trends in incidence of neonatal abstinence syndrome in Canada and associated healthcare resource utilization. *Drug and Alcohol Dependence*, *185*, 313–321. https://doi.org/10.1016/j.drugalcdep.2017.12.019

Finnegan, L. P., Connaughton, J. F., Jr., Kron, R. E., & Emich, J. P. (1975). Neonatal abstinence syndrome: Assessment and management. *Addictive Diseases*, *2* (1–2), 141–158.

Gomez-Pomar, E., & Finnegan, L. P. (2018). The epidemic of neonatal abstinence syndrome, historical references of its origins, assessment, and management. *Frontiers in Pediatrics*, *6*, Article 33. https://doi.org/10.3389/fped.2018.00033

Grisham, L. M., Stephen, M. M., Coykendall, M. R., Kane, M. F., Maurer, J. A., & Bader, M. Y. (2019). Eat, Sleep, Console approach: A family-centered model for the treatment of neonatal abstinence syndrome. *Advances in Neonatal Care*, *19*(2), 138–144. https://doi.org/10.1097/ANC.0000000000000581

Grossman, M. R., Berkwitt, A. K., Osborn, R. R., Xu, Y., Esserman, D. A., Shapiro, E. D., & Bizzarro, M. J. (2017). An initiative to improve the quality of care of infants with neonatal abstinence syndrome. *Pediatrics*, *139*(6), Article e20163360.

https://doi.org/10.1542/peds.2016-3360

Grossman, M. R., Lipshaw, M. J., Osborn, R. R., & Berkwitt, A. K. (2018). A novel approach to assessing infants with neonatal abstinence syndrome. *Hospital Pediatrics*, *8*(1), 1–6. https://doi.org/10.1542/hpeds.2017-0128

Grossman, M. R., Osborn, R. R., & Berkwitt, A. K. (2017). Neonatal abstinence syndrome: Time for a reappraisal. *Hospital Pediatrics*, *7*(2), 115–116. https://doi.org/10.1542/hpeds.2016-0119

Hein, S., Clouser, B., Tamim, M. M., Lockett, D., Brauer, K., & Cooper, L. (2021). Eat, Sleep, Console and adjunctive buprenorphine improved outcomes in neonatal opioid withdrawal syndrome. *Advances in Neonatal Care*, *21*(1), 41–48. https://doi.org/10.1097/ANC.0000000000000824

Hirai, A. H., Ko, J. Y., Owens, P. L., Stocks, C., & Patrick, S. W. (2021). Neonatal abstinence syndrome and maternal opioid-related diagnoses in the US, 2010–2017. *JAMA*, *325*(2), 146–155. https://doi.org/10.1001/jama.2020.24991

Holmes, A. V., Atwood, E. C., Whalen, B., Beliveau, J., Jarvis, J. D., Matulis, J. C., & Ralston, S. L. (2016). Rooming-in to treat neonatal abstinence syndrome: Improved family-centered care at lower cost. *Pediatrics*, *137*(6), Article e20152929. https://doi.org/10.1542/peds.2015-2929

Knopf, A. (2017). To treat NAS, use mother-infant bond; Results include reduced use of morphine, length of stay, and costs. *The Brown University Child and Adolescent Behavior Letter*, *33*(7), 1–7. https://doi.org/10.1002/cbl.30223

Kocherlakota, P. (2014). Neonatal abstinence syndrome. *Pediatrics*, *134*(2), e547–e561. https://doi.org/10.1542/peds.2013-3524

Lacaze-Masmonteil, T., & O'Flaherty, P. (2018). Managing infants born to mothers who

have used opioids during pregnancy. *Paediatrics & Child Health*, *23*(3), 220–226. https://doi.org/10.1093/pch/pxx199

Lavoie-Tremblay, M., Chevrier, A., Emed, J., Clausen, C., Biron, A., Oliver, C., & Aube, T. (2019, November). *Global shortage of nurses*. McGill University, Ingram School of Nursing. https://www.mcgill.ca/nursing/files/nursing/nurse_shortages.pdf

Miller, P. A., & Willier, T. (2021). Baby STRENGTH: Eat, Sleep, Console for infants with neonatal abstinence syndrome. *Advances in Neonatal Care*, *21*(2), 99–106. https://doi.org/10.1097/ANC.0000000000000840

National Institute for Children's Health Quality. (2019, January 16). *A mother-centered approach to treating neonatal abstinence syndrome*. https://www.nichq.org/insight/mother-centered-approach-treating-neonatal-abstinence-syndrome

Nayeri, F., Ebrahim, B., Shariat, M., Dalili, H., Kalani, M., Karbasian, N., & Sheikh, M. (2017). Treating neonatal abstinence syndrome from clinical perspectives. *Iranian Journal of Pediatrics*, *27*(4), Article e6266. https://doi.org/10.5812/ijp.6266

Nota Bene Consulting Group, BC Women's Hospital and Health Centre, & Provincial Health Services Authority. (2022, June). *Implementing Eat, Sleep, Console*. http://www.bcwomens.ca/Professional-Resources-site/Documents/PHSA_implementing%20eat-sleep-console-vFIN.pdf

Pahl, A., Young, L., Buus-Frank, M. E., Marcellus, L., & Soll, R. (2020). Non-pharmacological care for opioid withdrawal in newborns. *Cochrane Database of Systematic Reviews*, *2020*(12), Article CD013217. https://doi.org/10.1002/14651858.CD013217.pub2

Parlaman, J., Deodhar, P., Sanders, V., Jerome, J., & McDaniel, C. (2019). Improving care for infants with neonatal abstinence syndrome: A multicenter, community hospital–based study. *Hospital Pediatrics*, *9*(8), 608–614. https://doi.org/10.1542/hpeds.2019-0083

Patrick, S. W., Schumacher, R. E., Horbar, J. D., Buus-Frank, M. E., Edwards, E. M., Morrow, K. A., Ferrelli, K. R., Picarillo, A. P., Gupta, M., & Soll, R. F. (2016). Improving care for neonatal abstinence syndrome. *Pediatrics*, *137*(5), Article e20153835. https://doi.org/10.1542/peds.2015-3835

Perinatal Services BC. (2020, November). *Practice resource: Care of the newborn exposed to substances during pregnancy: Instructional manual*. http://www.perinatalservicesbc.ca/Documents/Education/Practice%20Resource%20ESC_WEB%202020_11_20.pdf

Ponder, K. L., Egesdal, C., Kuller, J., & Joe, P. (2021). Project Console: A quality improvement initiative for neonatal abstinence syndrome in a children's hospital level IV neonatal intensive care unit. *BMJ Open Quality*, *10*(2), Article e001079. https://doi.org/10.1136/bmjoq-2020-001079

Rockefeller, K., Macken, L. C., & Craig, A. (2019). Trying to do what is best: A qualitative study of maternal–infant bonding and neonatal abstinence syndrome. *Advances in Neonatal Care*, *19*(5), E3–E15. https://doi.org/10.1097/ANC.0000000000000616

Schiff, D. M., & Grossman, M. R. (2019). Beyond the Finnegan scoring system: Novel assessment and diagnostic techniques for the opioid-exposed infant. *Seminars in Fetal & Neonatal Medicine*, *24*(2), 115–120. https://doi.org/10.1016/j.siny.2019.01.003

Singh, R., & Davis, J. M. (2021). Escaping the Finnegan – Is it time? *Seminars in Fetal & Neonatal Medicine*, *26*(3), Article 101218. https://doi.org/10.1016/j.siny.2021.101218

Timpson, W., Killoran, C., Maranda, L., Picarillo, A., & Bloch-Salisbury, E. (2018). A quality improvement initiative to increase scoring consistency and accuracy of the Finnegan Tool: Challenges in obtaining reliable assessments of drug withdrawal in neonatal abstinence syndrome. *Advances in Neonatal Care*, *18*(1), 70–78. https://doi.org/10.1097/ANC.0000000000000441

Verklan, M. T. (2019). Time for the Finnegan Neonatal Abstinence Syndrome Scoring Tool to be retired? *The Journal of Perinatal & Neonatal Nursing*, *33*(3), 276–277. https://doi.org/10.1097/JPN.0000000000000427

Wachman, E. M., Grossman, M., Minear, S., & Whalen, B. (2017). *Eating, Sleeping, Consoling (ESC) neonatal abstinence syndrome (NAS) care tool instructional manual* (1st ed.). Boston Medical Center. https://www.cffutures.org/files/QIC_Resources/Learning_with_the_Expert/Eat_Sleep_console_manual_with_tools_Yale_Boston_NNEPQIN.pdf

Wachman, E. M., Grossman, M., Schiff, D. M., Philipp, B. L., Minear, S., Hutton, E., Saia, K., Nikita, F., Khattab, A., Nolin, A., Alvarez, C., Barry, K., Combs, G.,

Stickney, D., Driscoll, J., Humphreys, R., Burke, J., Farrell, C., Shrestha, H., & Whalen, B. L. (2018). Quality improvement initiative to improve inpatient outcomes for Neonatal Abstinence Syndrome. *Journal of Perinatology*, *38*(8), 1114–1122. https://doi.org/10.1038/s41372-018-0109-8

Whalen, B. L., Holmes, A. V., & Blythe, S. (2019). Models of care for neonatal abstinence syndrome: What works? *Seminars in Fetal & Neonatal Medicine*, *24*(2), 121–132. https://doi.org/10.1016/j.siny.2019.01.004

Winkelman, T. N. A., Villapiano, N., Kozhimannil, K. B., Davis, M. M., & Patrick, S. W. (2018). Incidence and costs of neonatal abstinence syndrome among infants with Medicaid: 2004–2014. *Pediatrics*, *141*(4), Article e20173520. https://doi.org/10.1542/peds.2017-3520

Zimmermann-Baer, U., Nötzli, U., Rentsch, K., & Bucher, H. U. (2010). Finnegan neonatal abstinence scoring system: Normal values for first 3 days and weeks 5–6 in non-addicted infants. *Addiction*, *105*(3), 524–528. https://doi.org/10.1111/j.1360-0443.2009.02802.x