

CARING FOR OPIOID-EXPOSED NEWBORNS USING THE EATING, SLEEPING, CONSOLING (ESC) CARE TOOL

Instructional Manual

2nd Edition

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Audience

Health care professionals (nurses, licensed nursing assistants, nurse practitioners, physicians, physician assistants, lactation consultants, occupational and physical therapists, researchers, medical and nursing students) who assess and care for newborns with Neonatal Abstinence Syndrome (NAS) due to in-utero opioid exposure.

Objectives

After completion of this training program, health care professionals will be able to:

- 1) Assess the ability of an opioid-exposed newborn to effectively eat, sleep, and console
- 2) Implement a step-wise approach to assessing infant consolability
- 3) Understand the purpose and indications of parent/care team huddles for NAS management
- 4) Achieve high reliability with use of the ESC Care Tool

Description of the Program and Website Link

In this program, you will: 1) Review this instructional manual, 2) Review the ESC Care Tool with Definitions (**Appendix A**) and Newborn Care Diary (**Appendix B**), 3) Watch an instructional video on the ESC Care Tool, and 4) review written and videotaped cases, performing assessments using the ESC Care Tool and then compare your assessments with the final key ratings. We recommend that you complete the program in this order.

An internet-based copy of these ESC training materials and an instructional video are available at the following link: <https://www.neoqicma.org/eat-sleep-console> (password: "nas2018esc"). ESC Care Tool training materials will be updated every 3-6 months, in an iterative manner, using feedback received from New Hampshire, Massachusetts, Maine, and Vermont hospitals piloting and training in its implementation in a Northern New England regional quality improvement (QI) collaborative.

Neonatal Abstinence Syndrome (NAS)

Neonatal Abstinence Syndrome (NAS) secondary to in-utero opioid exposure has increased 5-fold in the United States between 2000 and 2012 and now affects 5 per 1000 live births nationally.¹⁻² NAS typically refers to an opioid withdrawal syndrome characterized by behavioral dysregulation of the central, autonomic, and GI systems that occurs within 2-3 days of birth for infants exposed chronically to opioids in-utero.³ Experts in the field now recommend that NAS related to in-utero opioid exposure be referred to as Neonatal Opioid Withdrawal Syndrome (or NOWS). Signs and symptoms include altered sleep, high muscle tone, tremors, irritability, poor feeding, vomiting and diarrhea, sweating, tachypnea, fever, and other autonomic nervous system disturbances.³ All opioids can cause withdrawal symptoms, including long-acting agents methadone and buprenorphine (Subutex, Suboxone), and short-acting agents such as oxycodone, heroin, and fentanyl, but the severity of these symptoms vary greatly. All infants should receive non-pharmacologic (non-pharm) care as first-line treatment.³ Some infants may also require replacement opioids in addition. The American Academy of Pediatrics recommends that all opioid-exposed infants be monitored in the hospital for 4-7 days for signs of withdrawal that may require pharmacologic treatment.³ Without medication, symptoms typically resolve within 1-2 weeks. NAS can also occur after in-utero exposure to non-opioid agents such as benzodiazepines, selective serotonin reuptake inhibitors (SSRIs), and nicotine. Prenatal exposure to cocaine can also cause infant symptoms of neurologic dysregulation.⁴ The ESC Care Tool was developed to assess and care for newborns with in-utero opioid exposure to help monitor for and respond to symptoms specific to opioid withdrawal. Infants with NAS due to other agents may be cared for using all of the Non-Pharm Care Interventions recommended within this training manual but pharmacologic treatment with replacement opioids in the absence of opioid exposure is not recommended.

ESC Rationale and Development

The most commonly used NAS assessment tool in the U.S., often modified by individual institutions, is called the Neonatal Abstinence Syndrome Score (NASS).⁵⁻⁶ This tool, more commonly referred to as the Finnegan Scale, was developed in 1974. It contains a catalog of the most common neonatal opioid withdrawal symptoms with points assigned for each item based on its perceived severity. The Finnegan scale, or various modified versions of it, had an established inter-rater reliability coefficient of 0.82 when it was initially developed.⁵ Typically, Finnegan scores ≥ 8 (or ≥ 12) consecutively are used to initiate and titrate medication treatment. However, the rationale for using this score-based approach for medication initiation and titration has never been scientifically established or validated.

Recently, the validity of the NASS has been questioned due to concerns for its poor psychometric properties.⁷ Newer quality improvement studies suggest that decisions to initiate and titrate medication treatment may be better based on function-based assessments of the newborn especially regarding how well the infant is eating, sleeping, and consoling rather than on a numerical score-based approach.⁸⁻¹⁰ Data suggests that using a function-based assessment tool could result in reduced medication treatment rates and other improved outcomes.⁹⁻¹⁰ While we believe the infant should still continue to be assessed for significant signs of opioid withdrawal, the ESC care method's sole principles are to 1) optimize the newborn's functioning as a neonate through non-pharmacologic treatment provided by the parent (or other caregiver) and 2) reserving medication treatment only for those newborns who are unable to eat, sleep, or console despite maximal non-pharmacologic care (*or if other significant concerns are present such as seizures or apnea*). This method of assessing and caring for infants with NAS/NOWS was developed by a collaborative effort between faculty at Yale-New Haven Children's Hospital, Children's Hospital at Dartmouth-Hitchcock, and Boston Medical Center and is currently being tested for inter-rater reliability and construct validity in a Northern New England regional QI / learning collaborative.

Timing and Location of ESC Assessments

Staff should educate parents in use of the **ESC Care Tool**, its assessment items and their definitions, indications for **Formal Parent/Caregiver** and **Full Care Team Huddles**, and ways to optimally implement **Non-Pharm Care Interventions**. Staff should also educate parents in use of the **Newborn Care Diary**, **involvement in newborn assessments** including how well their baby is eating, sleeping and consoling, **best methods for consoling their infant**, and **requesting infant assessments after feedings**. Staff should perform ESC care assessments every 3-4 hours after feedings, clustering other infant and maternal care (e.g., vital signs) at the same time. Assessments should be initiated within 4-6 hours of birth and should continue for 4-7 days for infants exposed to long-acting opioids³ (e.g., buprenorphine, methadone) based on institutional guidelines and infant symptoms, and for a minimum of 48 hours for shorter acting opioids (e.g., oxycodone, codeine). Assessments should include all ESC behaviors that occurred since the infant's last assessment as well as all non-pharm care interventions implemented. Assessments should incorporate **input from all infant caregivers** (e.g., mother/other parent, nurse, cuddler, infant provider) who interacted with the infant during this time interval. Infants should be assessed in their own room and do not need to be removed from their mother (or other caregiver) if being held. We recommend that parents use the **Newborn Care Diary** to keep track of their infant's behaviors and for staff to incorporate these observations into their ESC assessments. Staff should document their ESC assessments and care recommendations on the ESC flowsheet, in the paper or electronic medical record, and share these with the parent (other caregiver) each time. For pharmacologically treated infants, ESC assessments should continue for at least 24 hours after stopping opioid replacement medication.

Eating

The first component of the ESC Care Tool is infant feeding: *“Does the infant have poor eating due to NAS – Yes / No?”*



Adequate eating depends on the **gestational** and **postnatal age** of the infant. “Eating well” is generally defined as breastfeeding 8-12 times per day with an effective latch and milk transfer *OR* feeding an expected volume for age with an alternative feeding method (e.g., bottle, syringe or cup feeding depending on parental preference and institutional care practice). Staff should encourage parents to feed their baby whenever showing hunger cues (e.g., desire to suck, hands to mouth, licking lips, rooting) and until content. If a pacifier is used, it should be introduced only after a baby has fed well and is no longer showing hunger cues. Due to the potential to interfere with a good latch, pacifiers should be withheld until babies are breastfeeding well unless difficulties with NAS are present.

Poor eating due to NAS: Baby **unable to coordinate feeding *within 10 minutes of showing hunger OR sustain feeding for at least 10 minutes at breast or with 10 mL by alternate feeding method*** (or other age-appropriate duration / volume) **due to opioid withdrawal symptoms** (e.g., fussiness, tremors, uncoordinated suck, excessive rooting).

Special Note: Do not indicate **Yes** if poor eating is **clearly due to non-opioid related factors** (e.g., prematurity, transitional sleepiness or spittiness in first 24 hours of life, inability to latch due to infant / maternal anatomical factors). If it is not clear if the poor eating is due to **NAS**, indicate **Yes** on the ESC flowsheet and continue to monitor the infant closely while optimizing all non-pharm care interventions.

OPTIMAL FEEDING:

- **Baby feeding when showing early feeding cues and until content**, on demand, without any limit placed on duration or volume of feeding. Baby should be offered feedings whenever showing the desire to suck.
- **Breastfeeding:** Baby latching deeply with comfortable latch for mother, and sustained active suckling for baby with only brief pauses noted. Staff assist directly with breastfeeding to achieve more optimal latch/position. Express colostrum and have baby feed on an adult finger first to organize suck prior to latching, as needed. Withhold pacifier use, as able. If infant is having difficulties coordinating feeding at breast, finger feeding or supplementation at breast with a Supplemental Nurser System (SNS) should be considered. If supplementation is felt to be indicated, the following priority should be given to type of milk: mother's own milk, donor human milk (if available), or formula (if other milk not available or mother desires).
- **Bottle feeding:** Baby effectively coordinating suck and swallow without gagging or excessive spitting up. Instruct parent to provide chin support, or modify position of bottle or flow of nipple if any concerns present.

- Consult lactation or feeding specialist if feeding difficulties continue despite above optimal feeding measures.

Sleeping

The second component of the ESC Care Tool is infant sleep: ***“Did the infant sleep less than 1 hour after feeding due to NAS – Yes / No?”***

Normal sleep patterns for **gestational** and **postnatal age** should be taken into account. Sleep < 1 hour may be normal in the first few days after birth, particularly in breastfed infants who are cluster feeding (i.e., feeding frequently in a short period of time especially during the night-time).



Sleep < 1 hour due to NAS: Baby **unable to sleep for at least one hour** after feeding due to **opioid withdrawal symptoms** (e.g., fussiness, restlessness, increased startle, tremors).

Special Note: Do not indicate **Yes** if sleep < 1 hour is **clearly due to non-opioid related factors** (e.g., symptoms in first day likely due to nicotine or SSRI withdrawal, physiologic cluster feeding in first few days of life, interruptions in sleep for routine newborn testing). If it is not clear if sleep < 1 hour is due to **NAS**, indicate **Yes** on the ESC flowsheet and continue to monitor the infant closely while optimizing all non-pharm care interventions.

Consoling

The final symptom component of the ESC Care Tool is infant consoling: *“Is the infant unable to be consoled within 10 minutes due to NAS – Yes/No?”*



Unable to console within 10 minutes due to NAS: Baby unable to console *within 10 minutes* (due to opioid withdrawal symptoms) despite infant caregiver/provider effectively providing any/all of the Consoling Support Interventions below.

Special Note: Do not indicate Yes if infant’s inconsolability is clearly due to non-opioid related difficulties (e.g., caregiver non-responsiveness to infant hunger cues, circumcision pain). If it is not clear if the inability to console within 10 minutes is due to NAS, indicate Yes on the ESC flowsheet and continue to monitor the infant closely while optimizing all non-pharm care interventions.

Consoling Support Interventions (CSIs)

Providers should consider performing the CSIs below in the following order to assess the level of support required for the infant to console. This approach was adapted from the Newborn Behavioral Observation (NBO) scale.¹¹ While performing the CSIs in the recommended order, providers should demonstrate to parents how to implement the interventions and discuss the infant’s response to them. Providers should also educate parents (and other caregivers) that they should offer CSIs in the manner that they feel is best at the time (e.g., feeding infant if showing hunger cues and picking up if crying) and do not need to go through a specific order to console their infant.

- 1) Caregiver/provider begins by softly and slowly talking to infant, using his/her voice to calm the baby.**



- 2) Caregiver/provider looks for hand to mouth movements and facilitates as needed by gently bringing the baby's uncovered hand to his/her mouth, watching for signs of consoling (eye opening, calming, slowed breathing).



- 3) Caregiver/provider continues talking to infant while placing hand firmly but gently on baby's abdomen.



- 4) Caregiver/provider continues softly talking to baby while bringing baby's arms and legs to the center of body.



5) Caregiver/provider picks up infant, holds skin-to-skin or swaddled in blanket, and gently rocks or sways infant.



6) Caregiver/provider offers a finger or pacifier for infant to suck on, or a feeding if infant showing hunger cues.



CONSOLING SUPPORT NEEDED

- 1. Able to console on own:** Able to console on own without any caregiver support needed.
- 2. Able to console with caregiver support within 10 min:** Able to console within 10 minutes with any level of consoling support provided by infant caregiver/provider.
- 3. Unable to console with caregiver support within 10 min:** Unable to console within 10 minutes despite caregiver/provider effectively implementing all levels of consoling support.

Parent/Caregiver and Full Care Team Huddles

A **Formal Parent/Caregiver Huddle** is **recommended at any time** if the infant has a **Yes** for **any ESC item OR 3 for Consoling Support Needed**. During the huddle, the infant's RN/provider and parent/caregiver should discuss 1) ways to further **optimize Non-Pharm Care Interventions** further including presence of a parent/caregiver, 2) infant's response to and efficacy of CSIs implemented, 3) efforts to improve feeding (when needed), and 4) assessment of the infant's environment. Staff should make all efforts to encourage the parent or another caregiver to be present **at all times** to provide optimal non-pharm care for the infant. If the infant continues to receive a **Yes** on any **ESC item** or a **3 for Consoling Support Needed** (*or other significant concerns are present*) **despite maximal non-pharm care**, a **Full Care Team Huddle** should be called including the parent/ caregiver, bedside nurse, **AND** infant physician or associate provider. Hospitals may individualize the manner in which the huddle is performed but at a minimum all those mentioned should be involved in medical decision making. A social worker should be included as needed to facilitate parental presence / engagement. **If non-pharm care is maximized to its fullest and the infant continues to have poor eating, sleeping, or consoling** (*or other significant concerns are present*) **and symptoms are felt due to opioid withdrawal, then an opioid replacement medication should be considered. Staff / providers should continue to follow the infant closely, maximizing all Non-Pharm Care Interventions regardless of management decision.**



Parental / Caregiver Presence

We recommend documentation on the ESC Care Tool flowsheet of the presence of a parent (biological or foster) or other caregiver (e.g., family support person, cuddler) at the bedside when assessments are performed.¹² Documentation should reflect parental/caregiver presence with the infant (in their own room or in Nursery for procedures) since the last ESC assessment. The ESC Care Tool includes a rating code from 0-4 with increasing code number indicating *greater* parental/caregiver presence. If the infant is having eating, sleeping, or consoling difficulties and the parent's (or other caregiver's) presence is less than the time since last assessment, staff should encourage ways to optimize presence further to help the infant through their withdrawal more effectively.



Non-Pharmacologic Care

First-line treatment for infants with in-utero opioid exposure is non-pharmacologic care³ which significantly reduces an infant's likelihood of needing pharmacologic treatment and its duration when initiated.^{6,9-10,12-13} We encourage a consistent institutional approach of **focusing on the parent as the primary caregiver and means of prevention and treatment for NAS**. Staff should review recommended **Non-Pharm Care Interventions** with families prenatally, upon birth admission, and at time of newborn assessments. Staff should regularly educate parents in these interventions including when and how to increase their use. Additionally, staff should recognize parents and reinforce interventions when they are implemented effectively. The infant's care team should **ensure that Non-Pharm Care Interventions are maximized to their fullest prior to considering pharmacologic treatment when** an infant demonstrates eating, sleeping, or consoling difficulties due to NAS. Staff should also instruct parents in CSIs as additional ways they can console their infant.

Recommended Non-Pharm Care Interventions:

- **Rooming-in** together and **Parent (or other caregiver) presence** throughout baby's entire hospital stay
- **Skin-to-skin contact** as much as possible with parent/caregiver fully awake to help calm baby and promote neurobehavioral organization
- **Holding / gentle rocking / swaying**
- **Use of cuddler program**, if available, for additional holding and support in the room
- **Safe swaddling / flexed positioning**
- **Optimal feeding at early hunger cues**; mothers are encouraged to breastfeed unless there is concern related to continued substance use or other medical contraindication is present (e.g., HIV)
- **Quiet environment** with low light stimulation in the room
- **Non-nutritive sucking** with finger or pacifier, as needed, ensuring baby is well fed first
- **Additional help / support** in room at all times with one caregiver napping while other caring for infant
- **Limiting visitors** to 1-2 at a time (and to those that will be quiet and supportive)
- **Clustering infant's care**, allowing for uninterrupted periods of rest/sleep for infant and caregivers
- **Safe sleep/infant fall prevention**: Ensuring that baby sleeps in their own bassinet, safely swaddled in a thin blanket or a safe sleep outfit, on their back, without any additional items placed in the bassinet. When holding the infant, the parent/caregiver should be fully awake. If sleepy, they should place the baby down in the bassinet *OR* ask another caregiver, cuddler, or staff member to help with the baby. Staff should encourage parent(s) to take a nap (*even for just 20 min*) whenever their baby is asleep, or being held by another caregiver, to help "refresh" and decrease the likelihood of falling asleep with their baby
- **Ensuring adequate parent/caregiver rest and self-care**: Staff/providers should acknowledge that infant's symptoms and hospitalization may be stressful and challenging (e.g., baby needing to be held all of the time to stay calm) and that it is ok to ask for help and/or take a break, when needed



Prenatal / Parent Education

We recommend that hospitals partner with prenatal clinics and treatment programs/providers in their area to provide in-person, written, and videotaped education (*as available*) regarding ways to best prepare for the newborn's NAS birth hospitalization. Recommended aspects of prenatal education include:

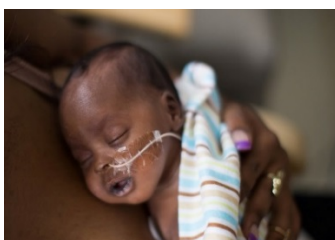
- Timing of and most common symptoms of NAS based on maternal medication or substance
- Ways to help manage withdrawal symptoms including skin-to-skin contact, breastfeeding, holding, rooming-in, parental/caregiver presence, quiet/calm environment, limiting visitors
- Importance of smoking cessation / cutting back to help decrease risk of / improve NAS and reduce risks related to smoking in pregnancy and passive smoke exposure after delivery (e.g., SIDS, ear infections)
- Plan to stay for baby's entire birth hospitalization (4-5 days at minimum, up to ~ 2 weeks if baby needs medicine) with help identified for in-hospital support and at-home help with other children/pets
- How to follow for problems eating, sleeping, and consoling due to withdrawal, and ways to help infant if symptoms are present
- Reasons why baby may need medicine and what to expect if this happens (e.g., duration and location of treatment)
- Ways to know that baby is ready for discharge and plans for early and close follow-up after going home

Additionally, birth hospitals should also provide in-person, written, and video (as available) education regarding the newborn's birth hospitalization, including resources available and ways that the family can best help their newborn through withdrawal. Examples of written prenatal / parent education are found in **Appendix C**.



Use of the ESC Care Tool in Preterm or Critically Ill Infants

For premature infants, the sleep and consoling items of the ESC Care Tool can still be used without modification. Given the feeding immaturity of premature infants, gestational and postnatal age-expected feeding patterns should be used as a baseline. If infant feeding ability and tolerance is significantly worse than expected for gestational age and felt (or possibly) due to **NAS**, indicate **Yes** for "Poor eating due to **NAS**". If the infant is intubated and sedated, or otherwise critically ill, assess infant in manner typically used in these clinical settings.



Inter-rater Reliability (IRR)

We recommend that sites train “gold star raters” in use of the ESC Care Tool so that they can then perform regular inter-rater reliability checks with bedside nursing staff (i.e., checking the reliability of ESC responses between two providers). We recommend using the **Eating, Sleeping, Consoling, Consoling Support Needed**, and **Formal Parent/Caregiver and Full Care Team Huddle** items **for inter-rater reliability checks** (total of 6 items). This means that one provider will perform the ESC assessment while a second provider simultaneously performs an independent assessment while directly observing the patient encounter. Providers then determine percent agreement between ESC items, with goal of a minimum of **80% agreement** (5/6 items) **for bedside staff**¹⁶ and **100% for “gold star raters”**. The ESC IRR Tool in *Appendix D* can be used to perform inter-rater reliability checks.

Pharmacologic Management

Opioid replacement medication should be considered for newborns that continue to have **Yes** responses to **ESC** items (or **3** for **Consoling Support Needed**) **due to NAS** after a **Full Care Team Huddle** (including parent/caregiver) and **maximal Non-Pharm Care Interventions**. In our institutions’ experience, less than 10-40% of infants with prenatal long-acting opioid exposure require pharmacologic treatment using the ESC assessment and non-pharm care method.⁹⁻¹⁰ In contrast, most studies report initiating pharmacologic therapy for NAS at a rate of 50-80% when using a numerical, score based-approach.^{1,3,6} Most often opioid withdrawal symptoms requiring pharmacologic treatment occur between day 3-4 of life.

The American Academy of Pediatrics recommends morphine or methadone as first-line pharmacologic treatment for NAS.^{3,14} A recent clinical trial suggests that buprenorphine may also be acceptable.¹⁵ Currently, no medications are FDA approved for the treatment of NAS and no universally accepted medication treatment protocol exists. We recommend that institutions develop a standardized approach to the assessment and treatment of NAS, and establish consistency between providers and care settings. Second-line pharmacologic agents can include phenobarbital or clonidine but should be used infrequently.³ Use of the ESC or a function-based approach to NAS care has also been associated with decreased use of second-line pharm treatment.¹⁰ Two sample medication treatment algorithms utilizing the ESC care approach are included in *Appendix E*.

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Appendix A

EATING, SLEEPING, CONSOLING (ESC) CARE TOOL

- Review ESC behaviors with parents since last assessment 3-4 hours ago using Newborn Care Diary.
- If infant with Yes for any ESC item or 3 for Consoling Support Needed: Perform a Formal Parent/Caregiver Huddle to determine Non-Pharm Care Interventions to be optimized further and continue to monitor closely.
 - If not clear if infant's difficulties eating, sleeping or consoling are due to NAS, indicate Yes and continue to monitor closely while optimizing all Non-Pharm Care Interventions.
- If infant continues with Yes for any ESC item or 3 for Consoling Support Needed (or other significant concerns are present) despite maximal non-pharm care: Perform a Full Care Team Huddle to determine if medication treatment is needed. Continue to follow infant closely, maximizing all Non-Pharm Care Interventions.

See back of sheet for definition of items prior to performing assessment

ESC Care Tool 2.25.18

TIME								
EATING								
Poor eating due to NAS? Yes / No								
SLEEPING								
Sleep < 1 hr due to NAS? Yes / No								
CONSOLING								
Unable to console within 10 min due to NAS? Yes / No								
Consoling Support Needed								
1: Able to console on own								
2: Able to console with caregiver support within 10 min								
3: Unable to console with caregiver support within 10 min								
PLAN OF CARE								
Recommend Formal Parent/Caregiver Huddle? Yes / No								
Recommend Full Care Team Huddle? Yes / No								
Management Decision								
1: Continue/Optimize Non-pharm Care								
2: Initiate Medication Treatment								
3: Continue Medication Treatment								
4: Other (please describe)								
PARENTAL / CAREGIVER PRESENCE								
0: No parent present								
1: < 1 hour								
2: 1-2 hours								
3: 2-3 hours								
4: > 3 hours								
NON-PHARM CARE INTERVENTIONS								
Rooming-in: Increase / Reinforce								
Parent/caregiver presence: Increase / Reinforce								
Skin-to-skin contact: Increase / Reinforce								
Holding by caregiver / cuddler: Increase / Reinforce								
Safe swaddling: Increase / Reinforce								
Optimal feeding at early hunger cues: Increase / Reinforce								
Quiet, low light environment: Increase / Reinforce								
Non-nutritive sucking / pacifier: Increase / Reinforce / Not Needed								
Additional help / support in room: Increase / Reinforce								
Limiting # of visitors: Increase / Reinforce								
Clustering care: Increase / Reinforce								
Safe sleep / fall prevention: Increase / Reinforce								
Parent/caregiver self-care & rest: Increase / Reinforce								
Optional Comments:								

DEFINITIONS

EATING

- **Poor eating due to NAS:** Baby unable to coordinate feeding *within 10 minutes* of showing hunger *OR* sustain feeding for *at least 10 minutes* at breast or with 10 mL by alternate feeding method (or other age-appropriate duration / volume) due to opioid withdrawal symptoms (e.g., fussiness, tremors, uncoordinated suck, excessive rooting).
- **Special Note:** Do not indicate **Yes** if poor eating is clearly due to non-opioid related factors (e.g., prematurity, transitional sleepiness or ~~spittiness~~ in first 24 hours, inability to latch due to infant / maternal anatomical factors).

SLEEPING

- **Sleep < 1 hour due to NAS:** Baby unable to sleep for *at least one hour* after feeding due to opioid withdrawal symptoms (e.g., fussiness, restlessness, increased startle, tremors).
- **Special Note:** Do not indicate **Yes** if sleep < 1 hour is clearly due to non-opioid related factors (e.g., symptoms in first day likely due to nicotine or SSRI withdrawal, physiologic cluster feeding in first few days of life, interruptions in sleep for routine newborn testing).

CONSOLING

- **Unable to console within 10 minutes due to NAS:** Baby unable to console *within 10 minutes* (due to opioid withdrawal symptoms) despite infant caregiver/provider effectively providing any/all of the Consoling Support Interventions below.
- **Special Note:** Do not indicate **Yes** if infant's inconsolability is clearly due to non-opioid related factors (e.g., caregiver non-responsiveness to infant hunger cues, circumcision pain).

Consoling Support Interventions (CSIs)

1. Caregiver begins softly and slowly talking to infant, using voice to calm infant.
2. Caregiver looks for hand-to-mouth movements and facilitates by gently bringing infant's hand to mouth.
3. Caregiver continues talking to infant and places caregiver's hand firmly but gently on infant's abdomen.
4. Caregiver continues softly talking to infant bringing baby's arms and legs to the center of body.
5. Caregiver picks up infant, holds skin-to-skin or swaddled in blanket, and gently rocks or sways infant.
6. Caregiver offers a finger or pacifier for infant to suck, or a feeding if infant showing hunger cues.
 - *Parent/caregiver should offer CSIs to infant in manner that they feel is best at the time (e.g., feeding if infant showing hunger cues, picking baby up if crying). Providers should consider introducing CSIs, in the order above, to assess the level of support needed to console the infant over time.*

CONSOLING SUPPORT NEEDED

1. **Able to console on own:** Able to console on own without any caregiver support needed.
2. **Able to console with caregiver support within 10 min:** Able to console within 10 minutes with any level of consoling support provided by infant caregiver/provider.
3. **Unable to console with caregiver support within 10 min:** Unable to console within 10 minutes despite caregiver or provider's effective implementation of all levels of consoling support.

PLAN OF CARE

- **Formal Parent/Caregiver Huddle:** RN bedside huddle with parent/caregiver to determine Non-Pharm Care Interventions to optimize ("Increase") further.
- **Full Care Team Huddle:** Bedside huddle with parent/caregiver, infant RN and physician or associate provider.

PARENTAL / CAREGIVER PRESENCE

- Time since last assessment that parent, or other caregiver, spent with infant in own room (or in Nursery for procedures).

OPTIMAL FEEDING:

- **Baby feeding when showing early hunger cues and until content,** on demand, without any limit placed on duration or volume of feeding. Baby should be offered feedings whenever showing the desire to suck.
- **Breastfeeding:** Baby latching deeply with comfortable latch for mother, and sustained active suckling for baby with only brief pauses noted. Staff assist directly with breastfeeding to achieve more optimal latch/position. Express colostrum and have baby feed on an adult finger first to organize suck prior to latching, as needed. Withhold pacifier use, as able.
- **Bottle feeding:** Baby effectively coordinating suck and swallow without gagging or excessive spitting up. Instruct parent to provide chin support, or modify position of bottle or flow of nipple if any feeding difficulties present.
- Consult lactation or feeding specialist if feeding difficulties continue despite above optimal feeding measures.

Appendix B

Newborn Care Diary

Baby's Name: Samantha Rose Baby's Med Record #: 1234567-2 Date: 2/14/18

Time of baby's feeding (start to finish)	Breast feeding (total # minutes)	Bottle feeding (total # mL)	Time when baby fell asleep	Time when baby woke up	Did baby feed well? (If no, please describe)	Did baby sleep for an hour or more? (If no, please describe)	Did baby console in 10 min? (If no, please describe)	Check box for pee	Check box for poop (please describe)	Extra Comments / Care Provided
example 12:15 pm- 12:40 pm	L – 15 min R – 10 min		8 am	12:00 pm	Yes but needed to suck on finger for 2 min before able to latch on ok	Yes	Yes - Was very fussy when woke up but calmed down after 5 min of holding and sucking on finger	✓	✓✓ loose	Last feed was 4 hr ago - will do skin-to-skin time and offer breastfeed sooner next time
example 2:30 pm- 2:45 pm	L-15 min		1:00 pm	2:05 pm	Yes but baby kept rooting around and had problems latching. Finally able to latch after 15 min of trying.	Yes	No – took 15 min to calm down while holding him skin-to-skin and sucking on my finger	✓	✓ watery	Startling easily and having more tremors Nurse helped me express my milk and get him latched on after changing my position Will put him on my chest skin-to-skin earlier next time and call for help prior to BF
	L – R –									

Appendix C

What happens if my baby does need medicine to treat NAS?

Right now, most babies who need medicine to treat NAS will be in the **hospital and on medicine for 10 to 14 days**. Some babies may need even longer. It is very important that you are able to stay with your baby this whole time as **you are still the most important treatment for your baby**. It is very important to plan ahead in case this happens!

- ★ Plan to have at least one family member or friend here with you to help care for your baby in your room.
- ★ Bring enough clothes and personal items with you to last for 2 weeks or more.
- ★ Plan to have someone watch your other children and/or pets while you are away.
- ★ Sometimes it is hard to talk to your family about why your baby might need to stay in the hospital. If this is true for you, ask your OB or Pediatric provider to help.



When can I take my baby home?

Your baby's care team will help decide when it is safe for your baby to go home. We will need to watch your baby for at least 4 to 5 days in the hospital to make sure all of the medicine or drug is out of your baby's body.

Your baby is ready to go home when he or she is:

- ★ Feeding and sleeping well.
- ★ Easy to console (calm down).
- ★ Has not lost too much or is gaining weight.
- ★ Able to maintain a healthy temperature, heart rate, and breathing.
- ★ Has received the hepatitis B vaccine and all newborn screening is done and normal.
- ★ No longer needs medicine, if it was started.
- ★ Has an appointment made with a home visiting nurse and primary care provider (PCP) for the first few days after discharge.

We look forward to working with you to help you and your baby have the best care possible. If you have any questions about any of the information in this pamphlet, please ask your pediatrician, a social worker or a nurse in the Birthing Pavilion.



Neonatal Abstinence Syndrome (NAS): Caring for your newborn

This informational pamphlet was developed by Dr. Bonny Whalen and staff at the Children's Hospital at Dartmouth-Hitchcock (CHaD).

Congratulations on your pregnancy and/or the birth of your new baby!

Our team is committed to providing you and your baby with the best care possible. The information in this pamphlet will help you learn how to best care for your baby after birth.

What is NAS?

- ★ Neonatal Abstinence Syndrome, or NAS, occurs when a baby withdraws from opioids after birth. It is also sometimes called Neonatal Opioid Withdrawal Syndrome (NOWS).
- ★ Most babies show signs of withdrawal 2 to 3 days after birth, but some may not show signs until day 4 or 5.
- ★ Your baby should stay in the hospital until most of the symptoms of NAS are over.

What are the most common signs of NAS?

- ★ Tremors, jitteriness, or shaking of arms and legs
- ★ Tight muscles in arms and legs
- ★ Fussiness
- ★ Problems eating or sleeping
- ★ Hard to console or calm down
- ★ Need for sucking when not hungry
- ★ Frequent spit ups or vomiting
- ★ Loose or watery stools (poops)
- ★ Trouble losing too much or not gaining enough weight (after day 4)

Serious symptoms like stopping breathing or seizures are possible but very rare.

NAS Scoring /Assessments

We will watch your baby closely for signs of withdrawal every few hours. Let your nurse know when your baby is done feeding as this is a good time to check your baby. *You can also help us watch your baby by keeping track of:*

- ★ How well your baby eats
- ★ How well your baby sleeps
- ★ How well your baby consoles (calms)
- ★ What kinds of things help your baby calm (holding, skin to skin contact, swaddling, sucking, a calm room)
- ★ Very loose or watery stools (poops)

We will give you a Newborn Care Diary to keep track of all of these things!

What will my care team do to make sure my baby is healthy?

- ★ During your baby's time in the hospital, you will be your baby's primary caregiver. We will be here to help you, but **your baby will do best if you are the one providing all of his/her care.**
- ★ We will monitor your baby in the hospital for **at least 4 to 5 days.**
- ★ If your baby has problems with eating, sleeping, or consoling we will teach you ways to help your baby.
- ★ If there are still problems after all that you and we have done to help your baby, medicine may be needed.

How can I best help my baby?

- ★ **ROOM IN TOGETHER:** One of the best things you can do for your baby is to keep him/her with you at all times in your own room. Being close to your baby helps you respond quickly to his/her needs. *Your baby will feel safest and most comfortable when close to you.*
- ★ **SKIN TO SKIN:** Spend as much time "skin to skin" with your baby when you are awake. This helps your baby eat and sleep better, and will help calm your baby. It can also help decrease other symptoms of withdrawal. *It also helps your milk supply when breastfeeding.*
- ★ **SWADDLE/CUDDLE:** Hold your baby or swaddle your baby in a light blanket. Just being close to someone, or "tucked" in a swaddle, helps your baby feel safe and comfortable. *Take advantage of our "Cuddler Program" if you need it!*
- ★ **A CALM ROOM:** Keep your room calm and quiet with the lights down low. Loud noises and bright lights may upset your baby.
- ★ **FEED AT EARLY HUNGER CUES:** Feed your baby whenever s/he is hungry and until content, at least every 3 hours. Breastfeed your baby, unless you are unable to do so for medical reasons.
- ★ **SUCKING:** If your baby still wants to suck after a good feeding, offer a finger or pacifier to suck on. This can be very comforting for your baby. *Always make sure your baby is not hungry first!*
- ★ **LIMIT VISITORS:** Try to have only one or two visitors in your room at a time as more may make your baby fussy or not sleep as well.



SUPPORTIVE BUNDLE OF CARE



Be with your baby:
You are part of your
infants treatment!

1. **Skin-to-skin:** Hold your baby skin-to-skin as much as possible. The whole family can join in the fun. Be careful though - if you are feeling sleepy, place your baby in the bassinette.
2. **Feed on Demand:** If you can, feed your baby breast milk and feed on demand. This means don't watch the clock; watch the baby for feeding cues.
3. **Calming Techniques:**
 - **Swaddle:** Tightly wrap your baby to help soothe them. Ask your nurses to show you!
 - **Pacifiers:** non-nutritive sucking
 - Shooshing
 - Slow, rhythmic up & down movements
4. **Quiet room:** keep the noise level as low as possible by limiting visitors, asking your adults friends and hospital staff to speak softly. keeping the TV volume low, talking on the phone quietly
5. **Dim the lighting** in your room.
6. **Cluster care** – ask your providers to group things together that need to be done to limit the interruptions to your baby.
7. **Medications** – Half of babies require medication to help with their withdrawal, to allow them to sleep, eat, and be comfortable.

Appendix D

EATING, SLEEPING, CONSOLING (ESC) IRR TOOL

- **Review ESC behaviors with parents since last assessment 3-4 hours ago using Newborn Care Diary.**
- If infant with **Yes** for any **ESC** item or **3** for **Consoling Support Needed**: Perform a **Formal Parent/Caregiver Huddle** to **determine Non-Pharm Care Interventions to be optimized further** and **continue to monitor closely**.
 - *If not clear if infant's difficulties eating, sleeping or consoling are due to NAS, indicate **Yes** and continue to monitor closely while optimizing all Non-Pharm Care Interventions.*
- If infant **continues with Yes** for any **ESC** item or **3** for **Consoling Support Needed** (or other significant concerns are present) **despite maximal non-pharm care**: Perform a **Full Care Team Huddle** to **determine if medication treatment is needed**. Continue to follow infant closely, maximizing all Non-Pharm Care Interventions.

DATE/TIME:	RN	"Gold Star" Rater
EATING		
Poor eating due to NAS? Yes / No		
SLEEPING		
Sleep < 1 hr due to NAS? Yes / No		
CONSOLING		
Unable to console within 10 min due to NAS? Yes / No		
Consoling Support Needed: 1: Able to console on own 2: Able to console with caregiver support within 10 min 3: Unable to console with caregiver support within 10 min		
PLAN OF CARE		
Recommend Formal Parent/Caregiver Huddle? Yes / No		
Recommend Full Care Team Huddle? Yes / No		
INTER-RATER RELIABILITY PERCENTAGE	%	

Determining Inter-rater Reliability Percentage: Calculate the percent agreement between the RN and the Gold Star rater on the 6 areas highlighted in yellow above. For example, if 6 out of 6 items are in agreement = 100% reliability, and if 5 out of 6 items are in agreement = 83% reliability.

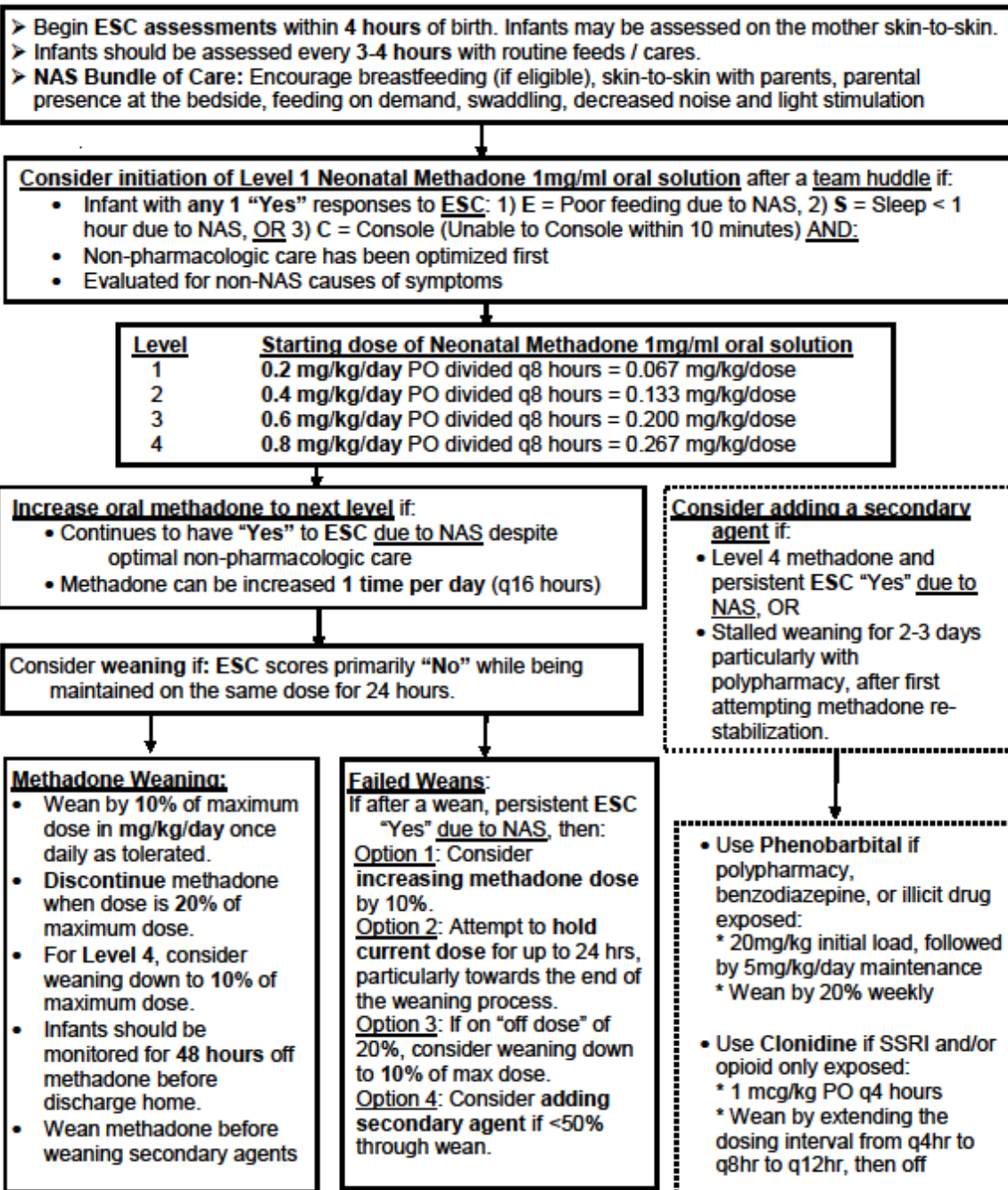
Hospitals may also use additional items from the full ESC Care Tool (Appendix A) to determine IRR, if desired.

Appendix E

Sample ESC-based Pharmacologic Treatment Regimens



Boston Medical Center NAS Pharmacologic Treatment Algorithm



Children's Hospital at Dartmouth-Hitchcock NAS Management Algorithm

- Assess infant **after feedings** preferably while **skin-to-skin** or **held swaddled** by mother/caregiver.
- Review **ESC** behaviors, which have occurred **since last assessment**, using **Newborn Care Diary** with parents.
- **Optimal non-pharm care:** **Breastfeeding** (if no medical contraindication), **rooming-in**, **parental presence**, **skin-to-skin**, **holding**, **swaddling**, **ad lib feeding** (at least every 3 hours), **quiet environment**, **limiting visitors**.
- If "Yes" to any ESC item or "3s" for "Soothing Support Used to Console Infant" (i.e., difficulty responding to all caregiver soothing efforts **OR** does not soothe within 10 minutes), perform **team huddle** with mother/parent & RN to determine **non-pharm interventions** that can be **optimized**.
- If continues with "Yes" for any ESC item or "3s" for "Soothing Support" despite **optimal non-pharm care**, perform **full team huddle** with mother/parent, RN and Infant Provider.

Morphine Initiation: Consider initiating oral Morphine after **full team huddle** if:

- Continues with "Yes" to any ESC item **OR** "3s" for "Soothing Support" **AND**
- Non-pharm care optimized to greatest extent **AND**
- Non-NAS causes excluded (e.g., cluster feeding, SSRI or nicotine withdrawal in first 24 hours)

Starting dose of Neonatal Morphine oral solution:

- 0.04 mg/kg/dose PO every 3 hours (use birthweight for dosing).

Morphine Escalation: Consider increase in morphine after **full team huddle** if:

- Continues with "Yes" to any ESC item **OR** "3s" for "Soothing Support" **AND**
- Non-pharm care optimized to greatest extent **AND**
- Non-NAS causes excluded

To increase oral morphine dose:

- Give bolus dose of 0.02 mg/kg once and increase baseline dose by 0.02 mg/kg/dose (e.g., baseline dose = 0.04 mg/kg/dose; new dose = 0.06 mg/kg/dose). Recommended maximum dose = 0.12 mg/kg/dose every 3 hours.

Consider adding **secondary agent** (e.g., clonidine, phenobarbital) if "Yes" responses to **ESC due to NAS AND non-pharm care optimized AND:**

- morphine dose maximized **OR**
- unable to wean by day 7 of treatment **OR**
- concern for polysubstance withdrawal (particularly if benzodiazepine co-exposure)

Morphine Weaning: Consider weaning if **primarily "No"** responses for ESC while on same dose for **24 hours** and **non-pharm care optimized**.

- Wean morphine maintenance dose by **10%** of maximum dose.
- If initial wean tolerated, wean up to **20%** of maintenance dose daily.
- Discontinue morphine when dose is less than or equal to:
 - a) 0.02 mg/kg/dose **OR**
 - b) dose no longer possible to measure for infant less than 2.5 kg
- Monitor for at least **24 hours** off morphine before discharge home.

Failed Weaning: If after weaning or discontinuation of morphine, infant has persistent "Yes" responses to **ESC due to NAS and non-pharm care optimized to greatest extent:**

- Restart last effective (or discontinuation) dose of morphine and maintain dose for minimum of 24 hours **OR**
- Attempt to **hold current dose** for up to 24 hours, particularly towards end of weaning process or after morphine discontinuation.