NNEPQIN's ESC Care Tool Journey:

Improving Outcomes for Opioid-Exposed Newborns in NH, ME & VT through use of the ESC Care Tool

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6/8/23

THE ESC CARE TOOL:

A SIMPLIFIED FUNCTION-BASED NOWS ASSESSMENT & CARE TOOL

- **Focus on baby's ability to eat, sleep, and console as key baby functions to assess and tailor NOWS management**
- **Parental presence/engagement in care**
  - Encourages staff to support parents as baby's primary caregiver
  - Promotes non-stigmatizing, trauma-informed care & parent-baby attachment
- **Non-pharm care interventions (NPIs) as 1st line therapy**
  - Rooming-in
  - Skin-to-skin & holding by parent/caregiver
  - Optimal feeding
  - Quiet, low light environment
  - Additional help/support for parents
  - Clustering care

EAT, SLEEP, CONSOLE (ESC) CARE TOOL 3rd edition v.4/22/21

- **Review ESC behaviors, signs of withdrawal,** 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 are currently being implemented well ("**R**"), **coach** in ways **other NPIs** can be **increased now** ("**I**"), and **educate** in ways to increase in the **future** ("**E**").
- **If Yes** for any ESC item *or* **3** for **Consoling Support Needed:** Perform a **Formal Parent/Caregiver Huddle**.
- **If 2nd Yes in a row** for **the same ESC** item *or* **2nd 3 in a row** for **Consoling Support Needed** *AND* **NPIs maximized** for infant's current clinical setting *OR* if **other significant concerns** are present: Perform a **Full Care Team Huddle**.

See back of ESC Care Tool for tool item definitions & details regarding Formal Parent Caregiver and Full Care Team Huddles

Perform assessment of ESC behaviors, signs of withdrawal, and NPIs for time period since last ESC assessment – note date/time:	
NOWS/NAS RISK ASSESSMENT	
Are signs specific for withdrawal present? (e.g., hyperactive startle/Moro, disturbed & undisturbed tremors, hypertonia, excessive/disorganized suck, watery stools, continuous crying/excessive irritability in absence of other etiology) 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 other significant concerns present? (e.g., apnea, seizures, excessive caregiver sleepiness) Yes / No / Unsure	
Are NPIs maximized to fullest extent possible in infant's current clinical setting? Yes / No / Unsure	
EATING	
Takes > 10 min to coordinate feeding *or* **breastfeeds: < 10 min** *or* **feeds < 10 mL** (*or* other age-appropriate duration/volume) **due to NOWS?** Yes / No	
SLEEPING	
Sleeps < 1 hr due to NOWS? Yes / No	
CONSOLING	
Takes > 10 min to console (*or* **cannot stay consoled for** *or least* **10 min) due to NOWS?** Yes / No	
Consoling Support Needed (*assessed independent of NOWS*) 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	
CARE PLAN	
Formal Parent/Caregiver Huddle Indicated to formally review NPIs to be increased further? Yes / No / NA (choose NA if Full Care Team Huddle indicated as this includes Parent/Caregiver)	
Full Care Team Huddle Indicated to formally discuss ESC difficulties and/or other significant concerns present, consider all possible etiologies for symptoms, re-assess if NPIs are maximized, and determine if NOWS pharmacologic treatment or other changes in management are needed? Yes / No	
Management Decision **a: Continue/Optimize NPIs** **b: Initiate NOWS Pharmacologic Treatment** (please list medication initiated) **c: Continue NOWS Pharmacologic Treatment** **d: Other** (please describe - e.g., LC & /or OT/PT Consult, Start 2nd Pharm Agent [indicate name], Increase, Wean or Stop Medication)	
PARENT/CAREGIVER PRESENCE SINCE LAST ASSESSMENT	
> 3 hours (includes if parent/caregiver present entire time), **2-3 hours, 1-2 hours, < 1 hour, 0 hours** (no parent/caregiver present)	
NON-PHARM CARE INTERVENTIONS (I = Increase Now, R = Reinforce, E = Educate for Future, NA = Not Applicable/Available)	
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, DCYF worker)	
Limiting # of visitors & duration of visit(s) to minimize disruptions in infant's care environment & sleep	
Clustering care & assessments with infant's awake times (e.g., ESC & 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 baby as parents not available or able to safely care for baby; other NPIs [please describe])	

OBJECTIVES

- **Discuss how the ESC care approach and ESC Care Tool have been developed** to aid in care of opioid-exposed newborns
- **List key steps in introducing the ESC Care Tool into care of opioid-exposed newborns** through standardized training and formal perinatal QI initiatives
- **Describe how QI implementation of the ESC Care Tool has helped decrease need for pharmacologic treatment and hospital length of stay** for opioid-exposed newborns in NH, ME, & VT

OVERVIEW

- **Development of the ESC Approach and ESC Care Tool:** CHaD/NNEPQIN's baseline QI work, Dr. Grossman (Yale)'s ESC approach, collaboration between CHaD, BMC, and Dr. Grossman for development of ESC Care Tool
- **Field Testing of the ESC Care Tool:** Pilot testing & formal QI implementation in Northern New England with standardized training, field testing, and iterative improvements
- **Beyond New England PQC QI Implementation:** Evaluating safety & efficacy of ESC care approach using ESC Care Tool for opioid-exposed newborns across varied settings & populations in the US

NNEPQIN NAS/NOWS/ESC QI COLLAB PDSAs

PDSA 1: April 2014 – Review of NNEPQINs "Care of Opioid-exposed Newborn Guideline" and limitations of Finnegan scoring system, ways to improve IRR, and scoring tips that focused on optimizing NPIs prior to scoring

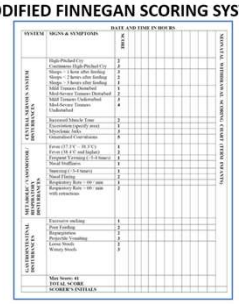
NNE PQIN NORTHERN NEW ENGLAND PERINATAL QUALITY IMPROVEMENT NETWORK

The following guidelines are intended only as a general educational resource for hospitals and clinicians, and are not intended to reflect or establish a standard of care or to replace individual clinician judgment and medical decision making for specific healthcare environments and patient situations.

NNEPQIN Guideline for the Management of Labor, Delivery and the Newborn in the Opioid Dependent Pregnancy

January 2014

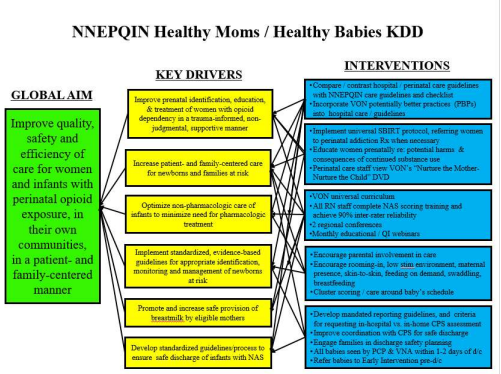
MODIFIED FINNEGAN SCORING SYSTEM



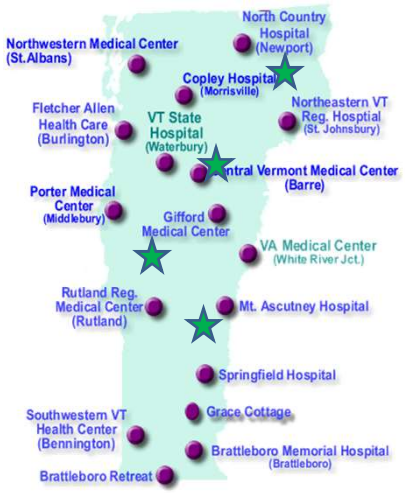
| SYSTEM | SIGNS & SYMPTOMS | DATE AND TIME IN HOURS | | |

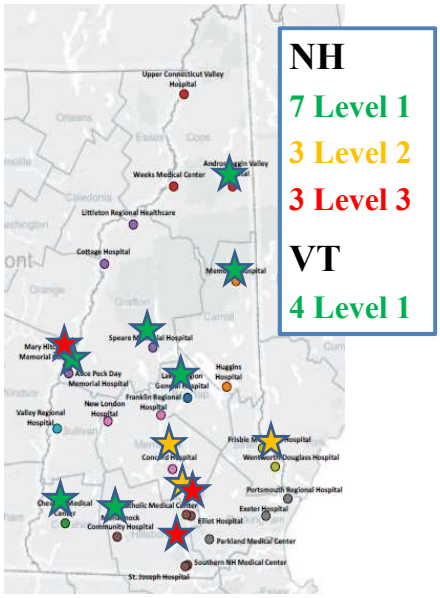
PDSA 3 (2014-2015):

- NNEPQIN's Healthy Moms/Healthy Babies (HMHB) NAS Learning / QI Collaborative formed with baseline hospital practice survey, conference, and proposed interventions based on VON's NAS "potentially better practices"/CHaD's early QI successes
- Initial grant funding from CHaD + Cardinal Health's multi-state NAS collaborative (PI Michelle Walsh) used to fund hospital participation in Years 2&3 of VON NAS iNICQ
  - 13 NH (7 Level 1, 3 Level 2, 3 Level 3) & 4 VT (Level 1) hospitals
  - VON webinars + national conferences
  - Regional conferences - topics based on HMHB key drivers and hospital needs assessment



INAUGURAL NNEPQIN NAS COLLABORATIVE HOSPITALS - 2015





PDSA 4 (2015-2017):

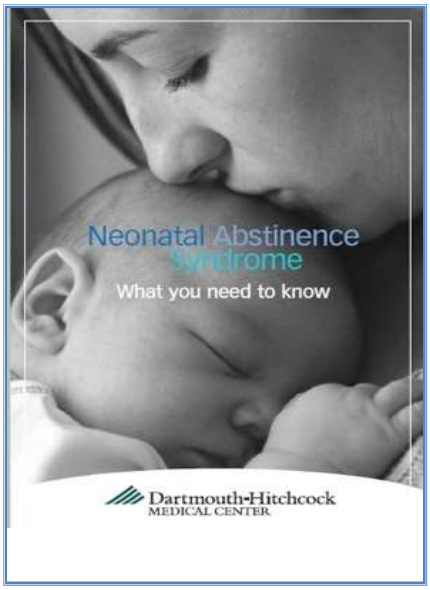
- Promoted use of NNEPQIN's previously developed guidelines for perinatal care of women with opioid use disorders and their newborns and created a guideline checklist to standardize birthing hospital care of opioid-exposed newborns
- Annual hospital care practice survey for tracking

Care of the Opioid-Exposed Infant Guideline Checklist

NNEPQIN Recommendations: *Each nursery that cares for neonates with in-utero opioid exposure should develop and adhere to a standardized approach to evaluation and comprehensive management including screening for maternal substance use, systematically assessing for signs of withdrawal, optimizing non-pharmacologic care including promoting and supporting parental engagement in care, rooming-in, skin-to-skin, and breastfeeding when no medical contraindications are present. Special consideration should also be given to referring families to community supports and promoting safe sleep environments for a safe transition to home.*

Guideline Checklist Items	Yes	No	N/A	Comments
Maternal drug and alcohol use screening in pregnancy	☐	☐	☐	
Indications for maternal toxicology testing on admission to the birthing unit (including confirmation of testing if performed and found to be positive)	☐	☐	☐	
Indications for newborn toxicology testing including one or more of the following (check box(es) below if utilized and can leave boxes to right blank) ☐ Urine (including indications for confirmation if performed and found to be positive) ☐ Meconium ☐ Umbilical cord	☐	☐	☐	
Objective scoring or assessment tool used in systematic assessment for NAS (please comment on assessment method used – e.g., Finnegan, Lipsitz, ESC)	☐	☐	☐	
Frequency of NAS assessments listed	☐	☐	☐	
Indications for increased frequency of assessment or evaluation by Infant Provider noted	☐	☐	☐	
Minimum recommended monitoring times for different opiates / opioids listed, including duration of observation after stopping pharmacologic treatment, if initiated	☐	☐	☐	
Family involvement in NAS monitoring encouraged (e.g., with symptom diary or if other method, *please describe*)	☐	☐	☐	
Family's observation incorporated into NAS scoring / assessments and score / assessment shared with family	☐	☐	☐	
Non-pharmacologic care methods encouraged ☐ Rooming-in ☐ Parental presence ☐ Skin-to-skin contact ☐ Holding/gentle rocking/swaying ☐ Swaddling / flexed positioning ☐ Optimal feeding including breastfeeding (as able) ☐ Non-nutritive sucking (pacifier, finger) ☐ Limiting visitors ☐ Providing uninterrupted periods of sleep / clustering care	☐	☐	☐	

PDSA 5 (2015):
Encouraged hospitals to develop parent education materials for care of opioid-exposed newborns, promoting education of mothers and families prenatally with focus on parental presence, rooming-in, breastfeeding, and skin-to-skin.



PDSA 6 (2015-2016):
Promoted a NNEPQIN NAS baby- and family-centered care bundle with optimization of non-pharm care prior to considering pharm Rx and treatment decisions based on symptom prioritization, with families to be involved in assessments including through use of a symptom diary.

- Regional conferences
- Hospital sharing
- Brainstorming

2015 NNEPQIN NAS "BUNDLE"

- **Prenatal education**
- **Maternal presence and rooming-in**
- **Breastfeeding** if no concerning maternal substance use
- **Baby-centered care / scoring**
  - Care / score based on infant's waking & feeding schedule
  - Skin-to-skin & (breast)feed pre-scoring
  - Skin-to-skin / hold during scoring
- **Involve family in care / scoring**
- **Bedside huddle for Finnegan scores 8 x 3, 2 x 12**
  - Optimize non-pharm rooming-in care further, as able
  - Consider treatment if any of following present and felt related to NAS:
    - Inability to 1) Eat, 2) Sleep, or 3) Console
    - Other significant physiologic disturbance (e.g., apnea, seizures, excessive weight loss or poor weight gain)

Baby's Symptom Diary

Baby's Name:_____ Baby's Med Record #:_____ Date:_____

Time when baby falls asleep	Time when baby wakes up	Time of baby's feeding	Breast feeding (total # minutes)	Bottle feeding (total # mL)	Check box for pee	Check box for poop (note if loose or watery)	Put check mark in box with each sneeze	Put check mark in box with each yawn	Excessive suck and not hungry	Parent Comments
10:00 am	12:00 pm	12:15 pm	L – 15 min R – 20 min	mL	√	√ loose	√√√	√	√	Was fussy after vaccine. Breastfed great.
			L - R -	mL						
			L - R -	mL						
			L - R -	mL						
			L - R -	mL						

Author: Bonny Whalen, MD and Staff at Dartmouth-Hitchcock Medical Center, Lebanon NH, April 2014

PDSA 7 (2015):

- **REDCap data registry** developed collaboratively with MA's NeoQIC/PNQIN
- **Data feedback provided** to participating NNEPQIN hospitals annually (8-11 hospitals contributing data)
- **At baseline:**
  - **Pharm Rx:** 31% of 378 opioid-exposed infants
  - **Mean LOS:** 9.4 days for all at-risk infants
    - ~17 days for pharm Rx
    - 5+ days for non-pharm care only

  Wide variation seen between hospitals
- **At end of 2016** (for those contributing data):
  - **Pharm Rx:** 26% infants
  - **Mean LOS:** 8.8 days

  Wide variation still present

NeoQIC / NNEPQIN Neonatal Abstinence Syndrome Improvement Initiative Data Form

Please fill out this form for all infants ≥ 37 weeks who had Finnegan scoring performed in your hospital.
Day of birth is considered day of life ONE for purpose of this data form.

Version: 2/11/15

DEMOGRAPHIC INFORMATION	
1. **Birth month (1-12) and year:**	Month: _____ Year: _____
2. **Birth weight**	Birth weight: _____ grams
3. **Gestational age in weeks and days:**	Weeks: _____ Days: _____
BASIC HOSPITALIZATION INFORMATION	
4. **Location of birth**	○ Inborn ○ Outborn
4b. **If outborn, what day of life was admission to your hospital?** *Day of birth is considered day of life ONE.*	Day of life of admission if outborn: _____
If outborn, complete all following fields based on all information available from your hospital as well as birth hospital. If information from birth hospital/transferring hospital is not available, indicate "unknown" or leave questions blank.	
5. **Was an antenatal consult done prior to birth with pediatrics or neonatology?**	○ Yes ○ No ○ Unknown
6. **In what locations did the infant receive care during hospitalization?** *Check all that apply.*	☐ Level 1 Nursery (newborn, mother-baby nursery) ☐ Level 2 Nursery (special care, intermediate care) ☐ Level 3 Nursery (intensive care unit) ☐ Pediatrics ☐ Other (Specify: _____)
7a. **If care included Level 3 nursery (intensive care unit), what day of life was admission to Level 3 nursery?** *Day of birth is considered day of life ONE.*	_____
7b. **If care included Level 3 nursery (intensive care unit), what day of life was discharge or transfer from Level 3 nursery?** *Day of birth is considered day of life ONE.*	_____
MATERNAL-FETAL EXPOSURES	
8. **What were the maternal-fetal opiate exposures?** *Check all that apply.* *Information can come from maternal self-report, maternal, or neonatal toxicology screening.* *Do not include if exposure was clearly only in the first trimester.* *Short-acting opioids include codeine, oxycodone, hydrocodone, morphine, and hydromorphine.* *Buprenorphine includes Subutex and Suboxone.*	☐ Short-acting opioids, prescribed ☐ Short-acting opioids, illicit ☐ Short-acting opioids, unknown source ☐ Methadone, prescribed ☐ Methadone, illicit ☐ Methadone, unknown ☐ Buprenorphine, prescribed ☐ Buprenorphine, illicit ☐ Buprenorphine, unknown ☐ Heroin ☐ No opioid exposure able to be determined

Check all that apply.

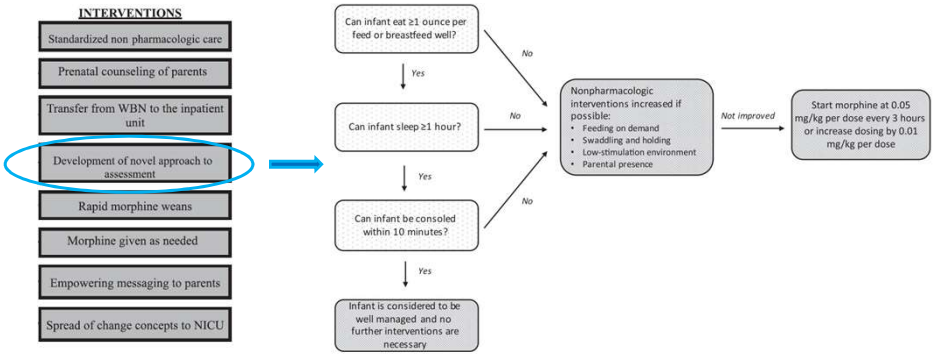
PDSA 8 (2016):
Development of the ESC Care Tool

Formal collaboration to develop structured ESC Care Tool to standardize definitions, clinical assessments & care approach based on Eat Sleep Console approach developed by Dr. Matthew Grossman at Yale:

- **Boston Medical Center** (BMC)
  Dr. Elisha Wachman, Dr. Susan Minear
- **Children's Hospital at Dartmouth-Hitchcock** (CHaD)
  Dr. Bonny Whalen, Dr. Kathryn MacMillan
- **Yale-New Haven Children's Hospital** (Yale)
  Dr. Matthew Grossman

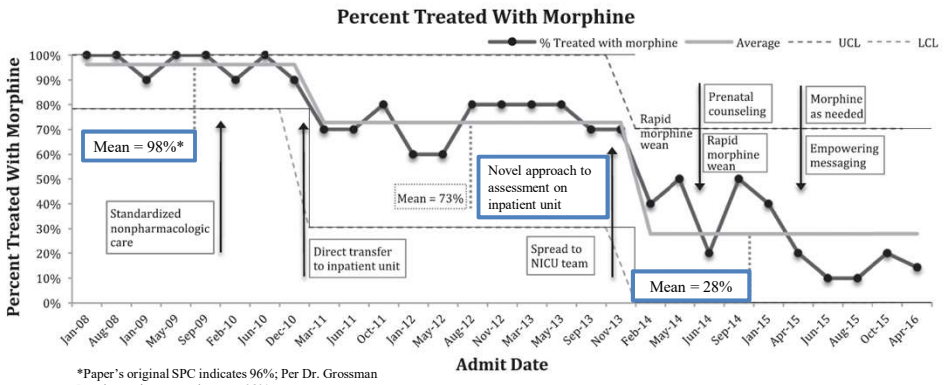
YALE'S ESC QI APPROACH

1. **Standardization of non-pharmacologic care**
2. **Focus on educating, supporting, and empowering families in the care of their infants**
3. **Function-based assessments to evaluate infants ability to eat, sleep and be consoled**



An Initiative to Improve the Quality of Care of Infants with Neonatal Abstinence Syndrome

Grossman et al. *Pediatrics*. 2017.



*Paper's original SPC indicates 96%; Per Dr. Grossman Results section correctly states 98%

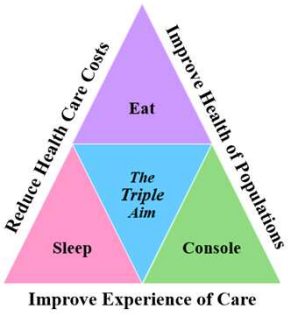
- **Morphine Rx decreased**: 98% to 28%
- **LOS decreased**: 22.4 days to 5.9 days
- **Hospital costs decreased**: $44,824 to $10,289
- **Balancing measures:** No readmissions, seizures, ICU transfers

YALE-NEW HAVEN CHILDREN'S HOSPITAL

ESC CARE TOOL QI AIMS

THROUGH DEVELOPMENT & IMPLEMENTATION OF A PATIENT-CENTERED, FUNCTION-BASED ESC ASSESSMENT & NON-PHARM CARE TOOL:

- **Improve Health of Populations** (Opioid-exposed Newborns)
  - Decrease pharmacologic treatment rates
  - Decrease LOS
- **Improve Experience of Care for Newborns, Families, Providers**
  - Simplified baby-centered assessments + parental engagement in care → improved newborn, family, & provider satisfaction
- **Reduce Health Care Costs**



PDSA 9 (2016): First version of ESC Care Tool pilot tested at Boston Medical Center in 12/16

BOSTON MEDICAL

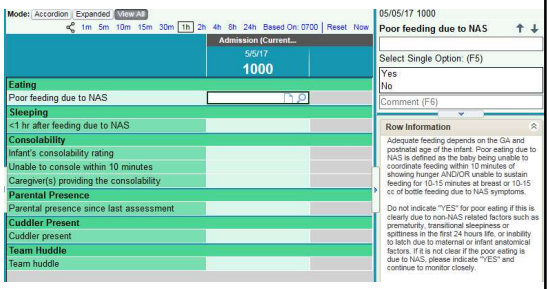
RESEARCH ARTICLE

Impact of Parental Presence at Infants' Bedside on Neonatal Abstinence Syndrome

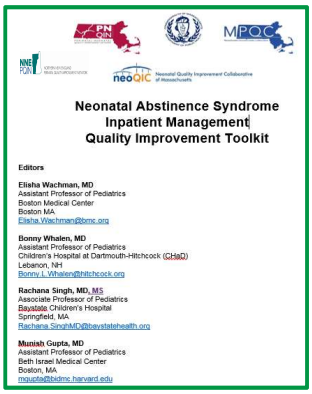
- N=86 treated infants 2015-2016
- Document parental presence in EPIC q4 hrs
- Average parental presence 54.4%
- Barriers to being at the bedside
- Maximum parental presence was associated with a 9 day shorter LOS, 8 fewer days of infant opioid therapy, and low Finnegan scores
- Independent of breastfeeding and co-variates

Hospital Pediatrics

Howard MB, Wachman EM, et al, *Hosp Pediatr*, 2017



PDSA 10 (2016): Development of NAS inpatient QI toolkit (led by Dr. Wachman of BMC/NeoQIC).



Neonatal Abstinence Syndrome Inpatient Management Quality Improvement Toolkit

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PDSA 11 (2017): Development of NNEPQIN Breastfeeding Guidelines for Women with a Substance Use Disorder (led by Dr. Whalen).

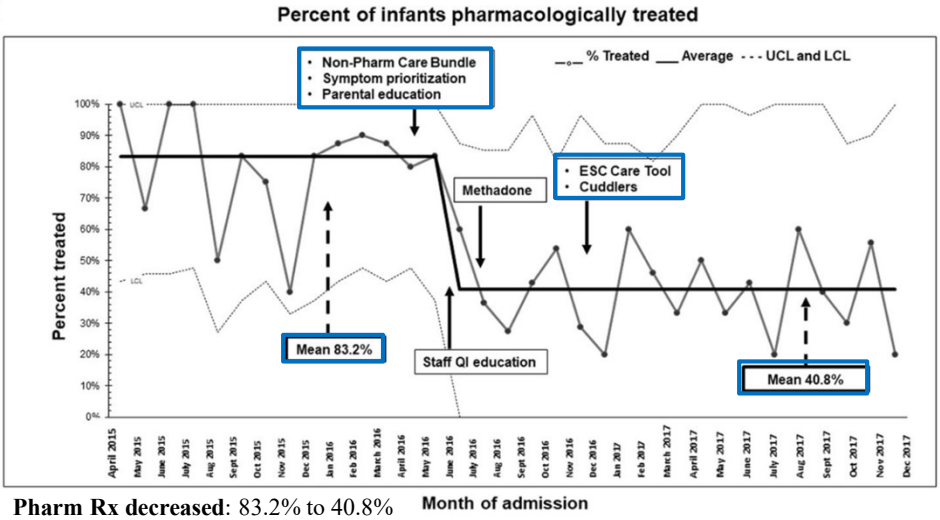
NNE PQIN NORTHERN NEW ENGLAND PERINATAL QUALITY IMPROVEMENT NETWORK

The following guidelines are intended only as a general educational resource for hospitals and clinicians, and are not intended to reflect or establish a standard of care or to replace individual clinician judgment and medical decision making for specific healthcare environments and patient situations.

NNEPQIN Breastfeeding Guidelines for Women with a Substance Use Disorder

Recommendations and Guiding Principles:

1. Mothers with substance use disorders (including those receiving medication assisted treatment with methadone or buprenorphine) with no other medical contraindication to breastfeed should be encouraged to breastfeed unless the risks of substance use clearly outweigh the medical, psychosocial, and financial benefits of breastfeeding. Women using alcohol or drugs should be advised, educated, and supported to cease alcohol or drug use due to risks of harm to infant during parenting and breastfeeding.
2. Decisions related to initiation and/or continuation of breastfeeding for women with substance use disorders should be made together with the woman, her obstetrical and treatment providers, lactation consultant(s), social worker(s), and infant provider(s) in an informed and individualized manner based on existing evidence available.
3. Communication with pregnant women with a history of substance use regarding nutritional recommendations should emphasize solidarity with and respect for the woman in order to support continued engagement in her needed care and support for high quality parenting.
4. Although substance use carries with it potential risk to the infant, substance use is not necessarily a contraindication to breastfeeding (WHO 2014). Therefore, a recommendation should be made to abstain from breastfeeding only if a woman expresses an intent to continue substance use *and* refuses substance use treatment.
5. Rapid urine drug screening is associated with a significant rate of false positives and thus confirmatory testing should be performed if screening results are inconsistent with maternal self-report.



Pharm Rx decreased: 83.2% to 40.8%
LOS decreased: 17.4 to 10.9 days
Hospital costs decreased: $31,825 to $20,668

Wachman et al. *Journal of Perinatology.* 2018.

PDSA 12 (2017):
Refined / expanded ESC Care Tool to include review of Non-Pharm Care Interventions to be reviewed with family at each ESC assessment based on pilot testing at BMC (no significant differences in % pharm Rx or LOS seen with ESC assessments and parental presence alone).

EATING, SLEEPING, CONSOLING (ESC) ASSESSMENT TOOL

Assess infant after feedings; preferably while skin-to-skin with mother or held swaddled by a parent / other caregiver; Only assess infant in bassinet if placed there already after feeding. Assessments should reflect entire 3-4 hour interval since last assessment.

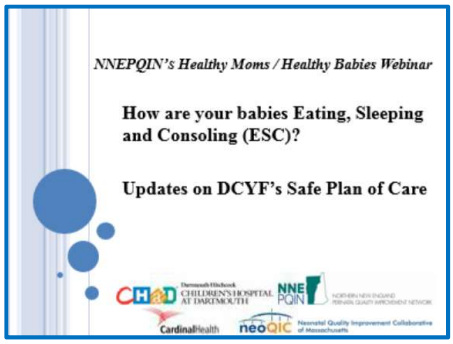
Perform Team Huddle if infant scores Yes for any ESC item & determine interventions needed; Consider initiating pharmacologic treatment only after non-pharm care interventions have been optimized to greatest extent.

See back of sheet for definition of items

TIME	1700	2100	2400	
EATING				
Poor eating due to NAS? Yes / No				
Sleep < 1 hr due to NAS? Yes / No				
Unable to console within 10 min due to NAS? Yes / No				
Soothing support used to console infant: Soothes with little support: 1 Soothes with some support: 2 Soothes with great support: 3				
Parental presence since last assessment: No parent present: 0 1 - 59 minutes: 1 1 hr – 1 hr 59 min: 2 2 hr – 2 hr 59 min: 3 3 hr+: 4				
Team Huddle called? Yes / No				
Team Huddle treatment decision: Optimize non-pharm care further: 1 Initiate medication treatment: 2				
Rooming-in: Increased / Reinforced				
Parental presence: Increased / Reinforced				
Skin-to-skin contact: Increased / Reinforced				
Holding by caregiver/cuddler: Increased / Reinforced				
Swaddling: Increased / Reinforced				
Optimal feeding quality: Increased / Reinforced				
Quiet environment: Increased / Reinforced				
Limit visitors: Increased / Reinforced				
Optional Comments:				

PDSA 13 (2017): Webinar Series

- Formal introduction of ESC care approach and 1st ESC Care Tool to NNEPQIN in Feb 2017 via kickoff of webinar series (background development of ESC care approach and pilot ESC Care Tool).
- Monthly webinar series includes challenging ESC cases, hospital brainstorming implementation strategies, successes, & barriers, data sharing, approaches to ESC staff/provider education & unit roll-out, safe sleep, cuddler programs, plan of safe care development).

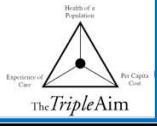


AIMS – THROUGH IMPLEMENTATION OF A PATIENT-CENTERED, FUNCTION-BASED ESC ASSESSMENT & OPTIMIZATION OF NON-PHARM CARE:

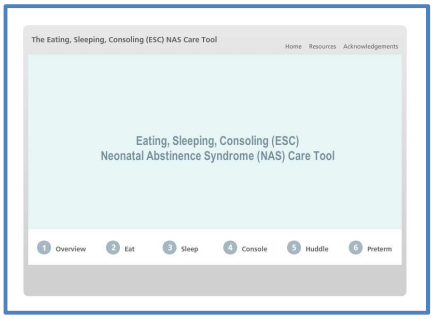
Improve health for newborns with NAS:
- Decrease need for pharmacologic treatment
- Decrease LOS

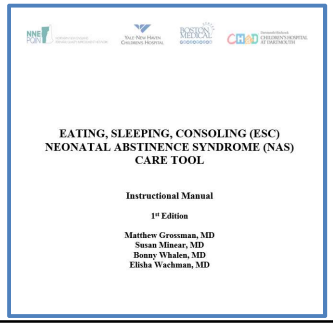
Improve care experience for baby, family, provider:
- Simplified assessment → improve family & provider satisfaction; decrease time spent in assessment

Improve value / costs:
- Decrease hospital costs



PDSA 14 (2017): Development of ESC Care Tool instructional manual (including case scenarios and rating key), training video, and updated newborn care diary.





EATING, SLEEPING, CONSOLING (ESC)
NEONATAL ABSTINENCE SYNDROME (NAS)
CARE TOOL

Instructional Manual

1st Edition

Matthew Grossman, MD
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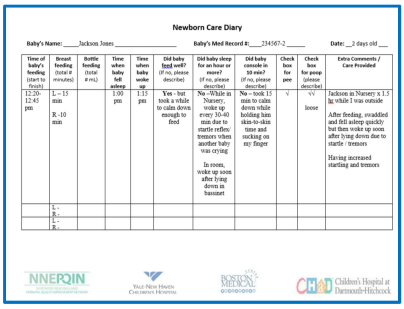


Newborn Care Diary

Baby's Name: ____Jackson Jones _____ Baby's Med Record #:____234567-2 _____ Date: __2 days old ___

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 30 min? (If no, please describe)	Check box for pee	Check box for poop (please describe)	Extra Comments / Care Provided
12:30-12:45 pm	L – 15 min R –10 min		1:00 pm	1:15 pm	Yes - but took a while to calm down enough to feed	No –While in Nursery, woke up every 30-40 min due to startle reflex; tremors when another baby was crying In room, woke up soon after lying down in bassinet	No – took 15 min to calm down while holding him; skin-to-skin time and sucking on my finger	√	√√ loose	Jackson in Nursery x 1.5 hr while I was outside After feeding, swaddled and fell asleep quickly; but then woke up soon after lying down due to startle / tremors Having increased startling and tremors
	L - : R - :									
	L - : R - :									

NNEPQIN Yale New Haven Children's Hospital Boston Medical CHaD Children's Hospital at Dartmouth-Hitchcock

PDSA 15 (2017): Development and inter-rater reliability (IRR) pilot testing of 3 written cases and 3 Objective Structured Clinical Examinations (OSCEs) to be used in ESC trainings.

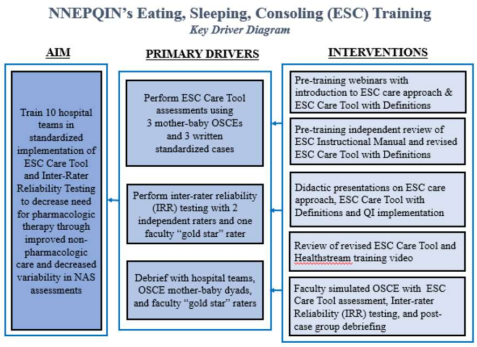
Written Case #3

- Term SGA baby born to healthy 19 year-old woman in a buprenorphine program since learning she was pregnant.
- Delivery complicated by maternal hypotension, tight nuchal cord and Apgars 1[1], 5[1], 8[1]. Cord pH 7.02, base deficit 12.
- Mom smokes ½ pod and takes no other medications.
- Baby with restrictive ankyloglossia and has problems sustaining latch at breast for more than 5 minutes. Baby supplementing by bottle and takes 45-60 minutes to bottle feed 15 cc, requiring chin support to maintain seal on bottle nipple.
- Baby now 2 days old with last feeding similar to that described above. Took a while to get baby to wake up to feed and baby more sleepy than has been. Slept 2-3 hours in the past 3 hour period.
- Parents present in room the whole time, providing calm room, limiting visitors, holding baby and responsive to teaching regarding all non-pharm care interventions.
- Baby not fussy, self-soothes easily or falls asleep during the feeding.
- Just now baby having jerking movements of arms and legs.

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	
Comments:	

PDSA 16 (2017-2019):

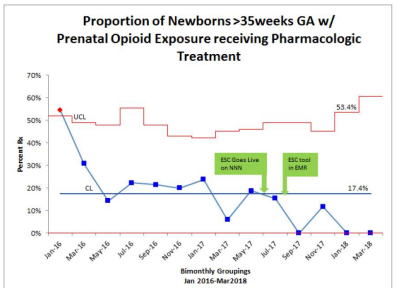
- 1st in-person ESC training day held in 6/17, 2nd + 3rd in 1/18, and 4th in 6/18 with 30 NNEPQIN 3-member hospital teams (15 NH, 11 VT, 4 ME)
- Standardized written cases and Objective Structured Clinical Examinations (OSCEs) with IRR testing performed with each case
- Training feedback used to improve cases and training format for each subsequent training
- Subsequent trainings through NNEPQIN and PNQIN

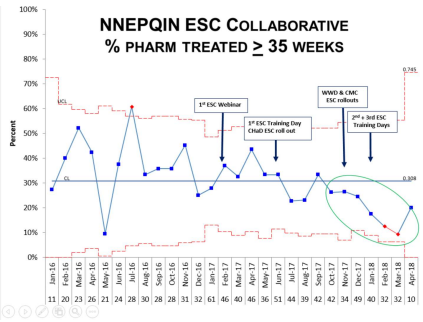


PDSA 17 (2017): Revised ESC Care Tool pilot tested in 3 NNEPQIN hospitals CHaD – Lebanon, NH (6/17), Wentworth Douglass Hospital – Dover, NH (11/17), & Catholic Medical Center – Manchester, NH (12/17).

Children's Hospital at Dartmouth-Hitchcock

NEED FOR PHARMACOTHERAPY- P-CHART





PDSA 18 (2017-18): Pilot IRR testing performed using videotaped 1st ESC training day recordings. Follow-up IRR testing performed using 2nd & 3rd training days using ESC Care Tool revised following ESC training #1.

Table 1. Percent Agreement for OSCE Raters and Gold Star Test-Retest Ratings

	Gold Star (n=30)	Indirect (n=60)	In-room (n=30)
Eating (E)	100%	100%	100%
Sleeping (S)	100%	83%	80%
Consoling (C)	97%	93%	93%
Soothing support (SS) used to console infant	93%	83%	90%
Team Huddle (TH) Recommendation	97%	87%	79%

REGIONAL COLLABORATIVE ROLL-OUT

PDSA 19 (2017): NeoQIC ESC Care Tool (password-protected) webpage developed with all ESC training materials housed here

PDSA 20 (2018): Formal NNEPQIN ESC parent education pamphlet developed

Neonatal Abstinence Syndrome (NAS): Caring for your newborn

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

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?

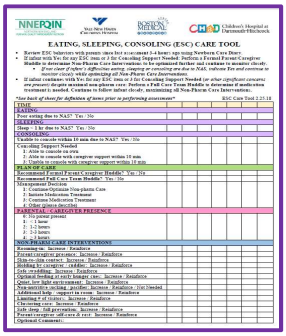
- ★ During your baby's ime in the hospital, you will be your baby's primary caregiver. We will be here to help you, but **your baby will do best if you are the one providing all of his/her care.**
- ★ We will monitor yotur baby in the hospital for **at least 4 to 5 days.**
- ★ If your baby has problems 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.

PDSA 21 (2018):

- **ESC Care Tool and training materials revised**, in an iterative manner, following ESC trainings using IRR testing results, transcribed and video-recorded feedback, and provider implementation verbal and written feedback to date.
- **Formal 2nd edition introduced in 2/18 & ESC Care Toolkit rolled out** at additional NNEPQIN hospitals winter-fall 2018.

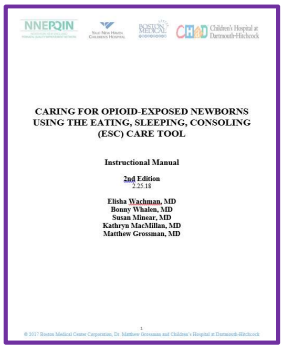


EATING, SLEEPING, CONSOLING (ESC) CARE TOOL

- Review ESC behaviors with parents since last assessment (3-4 hours) upon using Newborn Care Diary.
- If infant with Yes for any ESC item or if Re-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 continues with Yes for any ESC item or if Re-Consoling Support Needed despite optimized Non-Pharm Care Interventions: Consider NAS; indicate Rx and continue to monitor closely while optimizing all Non-Pharm Care Interventions.*
- If infant continues with Yes for any ESC item or if Re-Consoling Support Needed *or other significant concerns* despite optimized Non-Pharm Care Interventions: Consider Formal Team Huddle to determine if alternative interventions (treatment) needed. Continue to follow infant closely, optimizing all Non-Pharm Care Interventions.

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

ESC Care Tool 2.25.18							
EATING:							
Poor sucking due to NAS? Yes / No							
SLEEPING:							
Sleep < 1 hr due to NAS? Yes / No							
CONSOLING:							
Able 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							
Recommend Formal Parent/Caregiver Huddle? Yes / No							
Recommend Full Care Team Huddle? Yes / No							
Management Decision: 1: Continue Optimize Non-pharm Care 2: Consider Pharmacotherapy 3: Continue Medication Treatment 4: Other (please describe)							
PARAMETERS / ABSOLUTE PRESENCE (No pause 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 / Swaddling: Increase / Reinforce							
Sub 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							
Limiting visitors / stimulation: Increase / Reinforce							
Limiting # of visitors: Increase / Reinforce							
Clustering care: Increase / Reinforce							
Soft lung / bilt prevention: Increase / Reinforce							
Parent/caregiver self-care & rest: Increase / Reinforce							
Optional Comments:							



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

Instructional Manual

2nd Edition
2.25.18

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Matthew Grossman, MD

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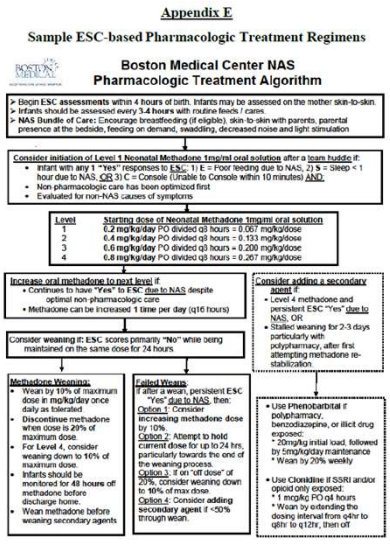
PDSA 22 (2018): Sample Pharm Rx Algorithms



Appendix E

Sample ESC-based Pharmacologic Treatment Regimens

Boston Medical Center NAS Pharmacologic Treatment Algorithm

- Begin ESC assessments within 4 hours of birth. Infants may be assessed on the mother skin-to-skin.
- Infants should be assessed every 3-4 hours with routine feeds / cares.
- NAS Bundle of Care: Encourage breastfeeding (if eligible), skin-to-skin with parents, parental presence at the bedside, feeding on demand, swaddling, decreased noise and light stimulation

Consider initiation of Level 1 Neonatal Methadone 1mg/ml oral solution after a team huddle if:
- Infant with any 1 "Yes" responses to ESC: 1) E = Poor feeding due to NAS, 2) S = Sleep < 1 hour due to NAS, OR 3) C = Console (Unable to Console within 10 minutes) AND:
- Non-pharmacologic care has been optimized first
- Evaluated for non-NAS causes of symptoms

Level	Starting dose of Neonatal Methadone 1mg/ml oral solution
1	0.2 mg/kg/day PO divided q3 hours = 0.067 mg/kg/dose
2	0.4 mg/kg/day PO divided q3 hours = 0.133 mg/kg/dose
3	0.6 mg/kg/day PO divided q3 hours = 0.200 mg/kg/dose
4	0.8 mg/kg/day PO divided q3 hours = 0.267 mg/kg/dose

Increase oral methadone to next level if
- Continues to have "Yes" to ESC due to NAS despite optimal non-pharmacologic care
- Methadone can be increased 1 time per day (q16 hours)

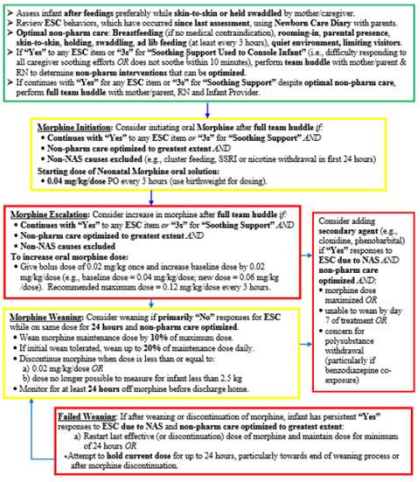
Consider weaning if: ESC scores primarily "No" while being maintained on the same dose for 24 hours

Consider adding a secondary agent if
- Level 4 methadone and persistent ESC "Yes" due to NAS, OR
- Stalled weaning for 2-3 days particularly with polypharmacy, after first attempting methadone re-stabilization

Methadone Weaning:
- Wean by 10% of maximum dose in mg/kg/day once daily as tolerated
- Discontinue methadone when dose is 20% of maximum dose.
- For Level 4, consider weaning down to 16% of maximum dose.
- Infants should be monitored for 48 hours off methadone before discharge home.
- Wean methadone before weaning secondary agents

Failed Wean:
If after a wean, persistent ESC "Yes" due to NAS, then:
Option 1: Consider increasing methadone dose by 10%.
Option 2: Attempt to hold current dose for up to 24 hrs, particularly towards the end of the weaning process.
Option 3: If on "off dose" of 20%, consider weaning down to 10% of max dose.
Option 4: Consider adding secondary agent if <50% through wean.

- Use Phenobarbital if polypharmacy, benzodiazepine, or illicit drug exposed:
  - 20mg/kg initial load, followed by 5mg/kg/day maintenance
  - Wean by 20% weekly
- Use Clonidine if SSRI and/or opioid only exposed:
  - 1 mcg/kg PO q4 hours
  - Wean by extending the dosing interval from q4hr to q8hr to q12hr, then off



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**:
- a) 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.

PDSA 23 (2018):
Scoring rubrics (with explanations) developed for standardized written cases and video-recorded OSCEs

Video Case 1

- 2 day old baby born at 41 weeks by vaginal delivery after a long induction.
- Mom on buprenorphine for 2 years, doing well in recovery.
- 1st baby. Lots of family and friends visiting in first day, now mom on her own. Keeps TV on for company; husband has to work long hours.
- Last assessment = 3 hours ago.

EATING	
Poor eating due to NAS? Yes / No	Yes
SLEEPING	
Sleep < 1 hr due to NAS? Yes / No	Yes
CONSOLING	
Unable to console within 10 min due to NAS? Yes / No	Yes
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	3
PLAN OF CARE	
Recommend Formal Parent/Caregiver Huddle? Yes / No	Yes
Recommend Full Care Team Huddle? Yes/No **Only if baby does not improve with non-pharm care optimized further*	No*
Management Decision 1: Continue Optimize Non-pharm Care 2: Initiate Medication Treatment 3: Continue Medication Treatment 4: Other (please describe)	1
PARENTAL / CAREGIVER PRESENCE	
0: No parent present 1: < 1 hour 2: 1-2 hours 3: 2-3 hours 4: > 3 hours	2
NON-PHARM CARE INTERVENTIONS	
Rooming-in: Increase / Reinforce	I
Parent/caregiver presence: Increase / Reinforce	I
Skin-to-skin contact: Increase / Reinforce	R
Holding by caregiver / cuddling: Increase / Reinforce	R
Safe swaddling: Increase / Reinforce	I
Optimal feeding at early hunger cues: Increase / Reinforce	I
Quiet, low light environment: Increase / Reinforce	R
Non-nutritive sucking / pacifier: Increase / Reinforce / Not Needed	I/R
Additional help / support in room: Increase / Reinforce	I
Limiting # of visitors: Increase / Reinforce	R
Clustering care: Increase / Reinforce	R
Safe sleep / fall prevention: Increase / Reinforce	R
Parent/caregiver self-care & rest: Increase / Reinforce	R
Optional Comments: Have baby go to breast with STS sooner than next feeding anticipated	*

Case 1: **Mom:** Ashley **In-room assessor:** Elisja **Gold star faculty:** Bonny

NAS-Eating difficulties: Baby w/ hard time today with difficulty settling. Baby very fussy even with STS. Mom tried to get him to latch, latched for a few seconds at a time, sucking a lot but not getting a good grasp. Mom tried to hold his head and baby excessively rooting on her hand so didn't stay latched. Mom expressed colostrum, had baby suck on finger, took 15 min still to settle/coordinate sucking despite this. Once able to get latched, did feed well x 10 min.

NAS-Sleeping difficulties: Baby waking up often due to tremors / startling and showing excessive suck out in Nursery. After feeding well, mom tried putting him down to sleep swaddled in bassinet in quiet room, but baby jumped awake and broke out of swaddle.

NAS-Consoling difficulties: Took 15 min to settle despite STS, hand expressing colostrum, sucking on finger.

Consoling Support Needed: 3 as unable to console on own despite caregiver support x 10 min.

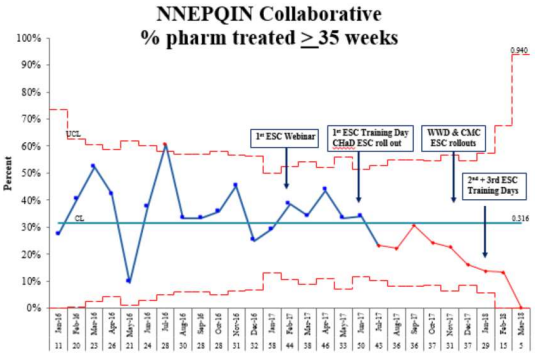
Formal Parent/Caregiver Huddle Recommended to review NPIs that can be optimized further:
Ask who is available to come in for support (mom w/ lots of visitors/help 1st day but now on own) to help baby have more rooming-in, cuddler program if other help not available, turn tv and lights down, optimizing feeding, swaddling, how to help get baby asleep – hands on baby, then take hands away, safe sleep. Would also recommend that mom try to identify feeding cues earlier (baby showing feeding cues when in nursery) and putting baby to breast with STS sooner to have baby there even before becoming hungry to help w/ feeding organization.

NPIS that can be reinforced: Maternal presence, STS and holding baby when awake, quiet, low light environment, non-nutritive sucking with finger of pacifier to help baby latch or sleep (using colostrum first, donor milk, formula, or sucrose as needed if colostrum not available), safe sleep & mom continuing to take short breaks, napping when baby naps.

Debriefing Session: Nurse reviewed Newborn Care Diary with mom and asked mom clarifying questions to complete ESC assessment. Mom notes appreciating no judgment for time spent outside and support provided through review of NPIs. Discussed ways to help w/ baby's feeding disorganization. Parent/Caregiver vs Full Care Team Huddle discussed.

PDSA 24 (2018):
~Monthly NNEPQIN data feedback started via March 2018 webinar.

- Data on % pharm Rx and LOS shared monthly, other data less frequently.
- As of 7/18: 14 hospitals submitting data on >1300 infants.



PDSA 25 (2018): Development of DH's formal perinatal SUD / SEN consult service "CARPP"

Contact us

Center for Addiction Recovery in Pregnancy and Parenting

- Our Team
- Resources for Providers
- Provider Q & A Service
- CARPP in the News
- For Mothers and Families

Center for Addiction Recovery in Pregnancy and Parenting

The Center for Addiction Recovery in Pregnancy and Parenting (CARPP) is a multidisciplinary network of experienced clinicians and researchers working together to support recovery from addiction for women who are pregnant and parenting, and to promote healthy growth and development in their children.

Center for Addiction Recovery *in Pregnancy + Parenting*

CARPP's work informs clinical services, research, education, and advocacy in the treatment of pregnant and parenting women and their young children who are impacted by substance use disorders. We support providers who care for these families with resources and guidance for program implementation, with a particular focus on the impact of opioid use disorders.

Providers with a question about caring for a pregnant or parenting woman with an SUD (or for her newborn/child) can contact the CARPP Q&A line using the contact information at the top of this page.

We gratefully acknowledge the support of New Hampshire Charitable Foundation, whose generous grants were instrumental in the formation of the Center and the ongoing work of the CARPP team.

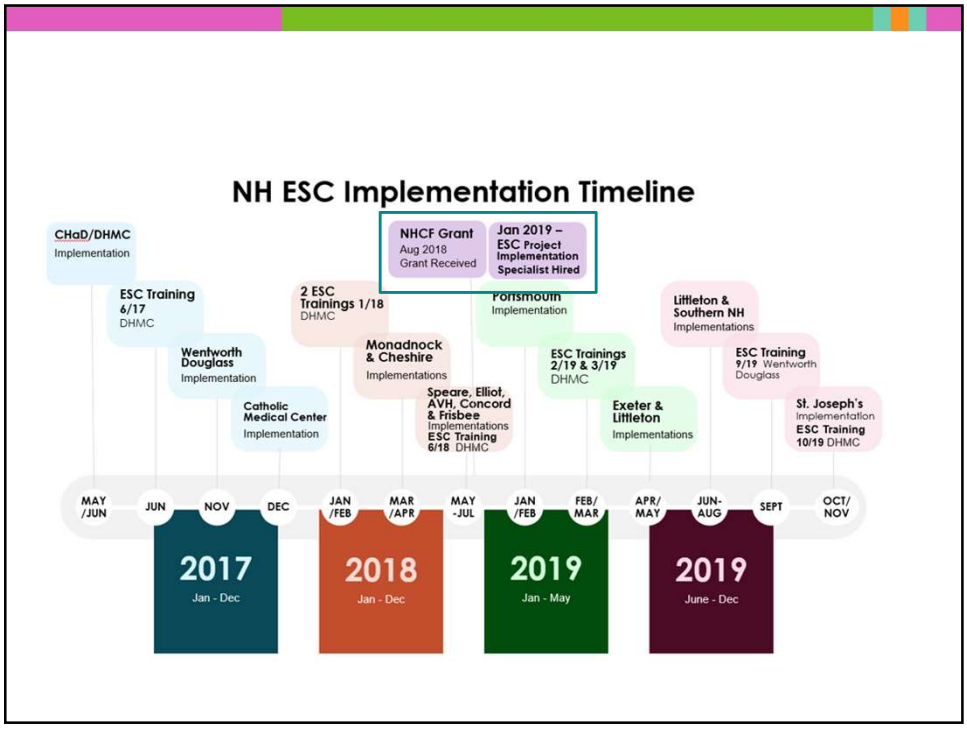
See the online resources for providers ›

PDSA 26 (2018-2020): NH Charitable Foundation funding

- **NH** (NNEPQIN) **NAS/ESC Project Lead** (Bonny)
- **NH** (NNEPQIN) **NAS/ESC Project Implementation Specialist** (Farrah)
  - Focused support for NH hospital ESC Implementation – needs assessments, targeted trainings and support

Implement ESC model in all 17 NH birth hospitals.

Provide training, tools, TA, coaching, and implementation support so that, no matter where an opioid exposed woman delivers, she and her baby and their family can have the best care to support them through delivery, in the immediate postpartum period and into the transition to parenthood



PDSA 27 (2019-2020): Continued webinar series with increased focus on ESC + POSC

NNEPQIN's 2019 Opioid-exposed Newborn Monthly Webinar Series
12-1 pm, 3rd Wed of Month *(except where noted)*

*If you would like to be added to the **NNEPQIN Opioid-exposed Newborn monthly webinar series**, please email: Karen G. Lee at **Karen.G.Lee@hitchcock.org***

Date	Agenda Topics / Presenters with Presentation Link	Recording Link*
Jan 16	**Welcome to Farrah Deselle,** NH's new ESC Project Manager **Regional experience with PRN/Rescue Dosing and Monitoring Policies:** • **Dr. Matt Grossman:** Yale's experience with PRN morphine & monitoring • **Dr. Elisha Wachman:** BMC's experience with PRN methadone & retrospective chart review of CVR monitoring for babies exposed to morphine vs methadone vs no opiate replacement medication • **NNEPQIN hospitals** ▪ **VT:** Rutland (with case of bradycardia), UVM ▪ **NH:** CHaD, CMC, Concord, Elliot, WWD ▪ **ME:** Maine Med **Upcoming Events/Resources** **https://drive.google.com/open?id=1o6GVkwEE-6LRQLjcxBYiVmFivadE3zC**	Play recording (1 hr 17 min 20 sec) *Jump forward to 5 min to hear start of presentation. Do not share beyond our NNEPQIN collaborative due to unpublished data in Dr. Wachman's presentation*
Feb 20	**ESC Project Updates:** Bonny **ESC Data Updates:** Bonny **NH's Plan of Safe Care:** Erin Collins and Kali Giovanditto **Upcoming Events/Resources** **https://drive.google.com/open?id=1AFA57NWxg5d6js8kZjH5-Tn83JL96v8H**	Play recording (56 min 18 sec)
March 20	**Regional data updates:** Kate/Alan **ESC Project Update:** Farrah **Potential Impact of Opioids on Neurodevelopment** • Katie Harris, Dartmouth College Research Intern • Dr. Nina Sand-Loud, CHaD Developmental Pediatrician • Dr. Alexa Craig, MMC Pediatric Neurologist **Upcoming events/resources** **https://drive.google.com/open?id=1aOAHBEPVZzMbhuCcqdGSp5GeLBUPU77i**	Play recording (1 hr 10 min 19 sec)
April 17	**Concord's ESC and POSC Journey:** Erin Collins **ESC Questions of the Month:** Bonny **ESC Updates:** Farrah **Upcoming Events:** Farrah **NNEPQIN Data Updates:** Alan/Kate **https://drive.google.com/open?id=1KHyEPxICCEBY2VJvPKjR23M7n5dnnwdt**	Play recording (54 min 34 sec)
May 15	**UVM's ESC Journey:** Adrienne Pahl **UVM's Longitudinal Follow-up and Neurodevelopmental Outcomes:** Jerilyn Metayer	Play recording (1 hr 14 min 30 sec)

NNEPQIN's Substance-Exposed Newborn "Community of Practice" Monthly Webinar Series 2020
12-1 pm, 3rd Wed of Month

This year's webinar series is focused on developing a "Community of Practice" to review & collaboratively brainstorm "real life" challenging cases that address the spectrum of challenges from prenatal care to the inpatient experience to transitions to home & community with peer- and content expert-brainstorming of effective strategies to collaboratively care for mothers, infants, and families with Perinatal Substance Exposure (PSE) using trauma-informed, evidence-based compassionate care & communication. Webinars are aligned with the national AIM initiative to improve maternal-infant outcomes and aim to engage all perinatal health care providers and community agencies/partners who care for mothers, infants, and families with PSE in our region. Birthing hospitals are encouraged to invite their Community of Practice partners to attend monthly webinars on site and/or remotely by webex / phone.

The following is a proposed webinar schedule. Webinar topics may change based on the needs/desires of this learning collaborative. Communities of Practice are encouraged to contact Bonny Whalen at Bonny.L.Whalen@hitchcock .org with any challenging cases that they would like to discuss and/or think would serve as a good case for inter-disciplinary discussion.

*If you would like to be added to the **NNEPQIN Substance-exposed Newborn monthly webinar series**, please email: Karen G. Lee at **Karen.G.Lee@hitchcock.org***

An additional goal for this year is to use these cases and the collaborative brainstorming of webinar presenters, panelists, and attendees to create additional standardized cases/learning modules for inter-disciplinary learning.

Date	Agenda Topics / Presenters with Presentation Link	Audience / Presentation
Jan 15	**Caring for Families with Resistance to Care and Challenging Behaviors** ***Presenters/Panel:*** • Sandy Decato, DHMC Social Worker • Karen Boehlker, DHMC Risk Manager • Gabi Teed, Perinatal SUD Care Coordinator, Amoskeag Health https://drive.google.com/open?id=1UDivQxsRZz1jlKlpJIIa7WebNABR8s5zN	https://dhvideo.webex.com/recordingservice/sites/dhvideo/recording/3afb4cfb70804db696a355a5a5ff0741
Feb 19	**Introduction of the ESC Care Tool Implementation Toolkit & its NNEPQIN password-protected webpage + Brainstorming QI Initiatives & REDCap Data Elements** – Farrah Deselle, Bonny Whalen, Kate MacMillan • ESC Care Tool – 3rd edition • Written + Video Cases with Scoring Keys & Teaching Scripts • Implementation Guide with Potential Challenges/Possible Solutions • Improving Care of Opioid-exposed Newborns using the ESC Care Tool manual *(in development)* • Brainstorming QI Initiatives & REDCap Data Elements https://drive.google.com/open?id=1EEZQfMEz5ILMVJzNeb3YbjiRltlwBs8	https://dhvideo.webex.com/recordingservice/sites/dhvideo/recording/play/8590d3edcccc4d7999e0892a1d4443fd Please start at ~11:30 due to significant AV difficulties at the beginning
Mar 18	**COVID-19 Obstetric/Newborn Discussion & Resources: Bonny Whalen /all** • **Case Review & Discussion of Care for an Opioid-exposed Newborn with ESC Difficulties and Excessive Weight Loss:** Bonny, Thea Crawford – CHaD Physical Therapy, Alexandra Marcotte - CHaD Nutrition, Brittany Smith – Mother with lived experience • **Review Questions of the Month:** ▪ What to do with sx from 1st line of updated ESC Care Tool? ▪ Should we pre-emptively start caloric supplementation for babies at risk for NAS/NOWS? ▪ Indications for NGT feedings?	https://dhvideo.webex.com/recordingservice/sites/dhvideo/recording/play/7ff02c166f2a4be7a7e4d597b12a999d

PDSA 28 (2019): NH (NNEPQIN) ESC Advisory Committee

Center for Addiction Recovery in Pregnancy + Parenting

NNEPQIN

NH Eat Sleep Console Implementation Project
Advisory Committee Meeting

April 10, 2019
NH Hospital Association
Concord, NH

Agenda

9:00 - 9:05 Welcome, moment of reflection, opening intention. (Farrah/Maggie)

9:05 - 9:25 Introductions, personal intention for Advisory Committee. (All)

9:25 - 9:40 NH ESC implementation status. (Farrah/Bonny)
Survey findings, training days feedback

9:40 - 9:50 ESC 3rd edition edits/changes/updates. (Bonny)

9:50 - 10:00 Break

10:00 - 10:10 Implementation Guide. (Farrah/Bonny)

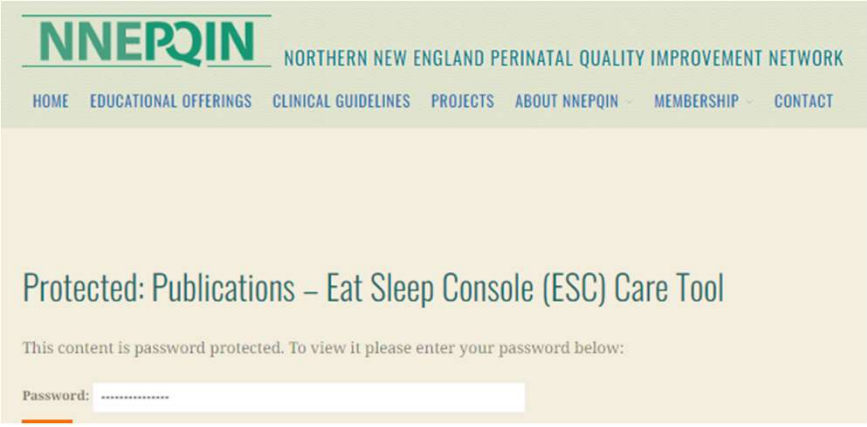
10:10 - 10:40 Advisory (All)
What is needed?
Task prioritization
Training Manual & Implementation Guide

10:40 - 10:50 Future meeting goals. (All)
Frequency
Super user group
Data collaborative group
POSC

10:50 - 11:00 Wrap Up/Meeting Reflections. (Farrah)
What went well?
What can we improve?

With great appreciation to NH Charitable Foundation for their ongoing support of this work.

PDSA 29 (2019): NNEPQIN ESC Care Tool webpage



https://www.nnepqin.org/clinical-guidelines/publications/

PDSA 30 (2019): ESC Implementation Checklist

Hospital Checklist for Adoption of Eat, Sleep, Console NAS Assessment & Care Approach

Item	Resources Available	Completed	Completion Date
TEAM DEVELOPMENT			
Create a multidisciplinary QI team • Ideally, team includes representatives from Addiction Psychiatry, Obstetrics, Labor and Delivery, Post-partum, Newborn Nursery, Pediatrics, SCN/NICU, Quality Improvement • Consider including: nurses, physicians, associate providers, physical & occupational therapists, social workers, care coordinators,nutritionist, lactation consultant, pharmacist, and parents • Identify one to two team leads / ESC champions	• Team roster list	☐	
Obtain support from hospital leadership to implement ESC Care Tool across varied hospital settings	• Letter for leadership outlining benefits of supporting ESC Care Tool implementation and rooming-in care for NAS	☐	
TRAINING			
Attendance at ESC simulation training workshop by 3-member hospital team (ideally nurse leader or QI specialist, infant provider, bedside nurse)	• Training day materials including pre-training day webinar PowerPoint (PPT), training day PPT, faculty simulation case, standardized written & videotaped cases, brainstorming barriers & strategies to hospital implementation	☐	
Participation in monthly NNEPQIN ESC/NAS webinars by at least one team member • Participation by whole team recommended • If whole team not able to attend, share webinar with whole team following webinar	• Monthly webinars: NNEPQIN 3rd Wed 12-1 pm • Webinar recordings	☐	
Educate all perinatal staff on use of ESC Care Tool • Target general education for all maternal and newborn staff/providers including in following care settings: ○ Prenatal clinics ○ Addiction treatment centers/practices ○ Birthing Pavilion ○ Pediatric / Family Medicine Clinics • Make materials widely available, including to community support agencies, as able	• Handout "Key Foundational Steps in Implementing the ESC Care Tool in Your Hospital Setting" includes Dr. Grossman's ESC care approach webinar, key steps, and published articles supporting ESC care approach • ESC Care Tool overview + NNEPQIN implementation PowerPoint	☐	
Provide further training on ESC assessments / care to appropriate staff/providers as relevant to their role in caring for opioid-exposed newborns, mothers, and their families • Set local criteria for completion of training and track appropriately	• General education materials above • ESC Care Tool with definitions • ESC training/care manual • ESC inter-rater reliability tool • ESC newborn care diary	☐	
• Suggested bedside RN standard: Complete ESC written & video case examples, and demonstrate 80% inter-rater reliability using case scoring key and bedside ESC Care Tool use in comparison to gold star rater assessment for E, S, C, Consoling Support Needed, and Formal Parent/Caregiver Huddle and Full Care Team Huddle • Suggested goldstar RN standard: 100% inter-rater reliability using written & video cases following ESC Care Tool sim center training	• ESC written cases with worksheets and scoring key • ESC written cases with worksheets and scoring key • ESC video cases with worksheets and scoring key		
HOSPITAL SYSTEMS			
Create appropriate system in EMR or on paper to allow for ESC Care Tool documentation	• ESC Care Tool paper form • EPIC instruction sheet • EPIC instruction webex • Cerner instruction	☐	
Modify appropriate policies and guidelines to incorporate ESC Care Tool assessments, Plans of Care (Formal Parent/Caregiver & Full Care Team Huddles, Management Decisions), Parental/Caregiver Presence, Non-Pharm Care Interventinos	• ESC Care Tool and definitions • ESC Care Tool training/care manual • Sample hospital protocols and policies	☐	
MONITORING IMPACT			
Participate in NNEPQIN REDCap data system • Identify REDCap data person • Complete DUA / Data Attestation form & email to Vicki Flanagan to obtain access • Enter baseline data for all opioid-exposed newborns assessed for NAS born in 2017 & since / going forward • Participate in NNEPQIN data/QI workshops and webinars to collaboratively discuss key data elements and track hospital outcomes/balancing measures related to ESC Care Tool implementation & other QI interventions	• NNEPQIN NAS data audit form • NNEPQIN's Attestations on Responsible Handling of Data • NNEPQIN benchmarking reports • NNEPQIN data/QI workshops and webinars	☐	

neoQIC NNEPQIN NORTHERN NEW ENGLAND PERINATAL QUALITY IMPROVEMENT NETWORK v 8.13.19

neoQIC NNEPQIN NORTHERN NEW ENGLAND PERINATAL QUALITY IMPROVEMENT NETWORK v 8.13.19

PDSA 31 (2020): ESC Care Tool Implementation Challenges & Solutions

NNEPQIN NORTHERN NEW ENGLAND PERINATAL QUALITY IMPROVEMENT NETWORK

Eat Sleep Console (ESC) Care Tool

Hospital Implementation

Potential Challenges and Possible Solutions

and Common Questions in Care of Opioid-exposed Newborns

Potential Challenges	Possible Solutions
PROVIDER AND LEADERSHIP	
Leadership/Corporate buy-In	• Review current hospital data / patient satisfaction survey results (if available) • Share ESC QI work to date including data on decreased a) need for pharmacologic treatment, b) length of stay (LOS), c) hospital costs and d) improved patient and staff satisfaction via: • Leadership letter • Leadership presentations • Find institutional ESC Care Tool leadership champion & pair w/ champion(s) from other hospitals • Validate concerns, when present
Provider buy-in	• Share data on decreased a) need for pharmacologic treatment, b) length of stay (LOS), c) hospital costs and improved patient and staff satisfaction via • Staff / provider education for prenatal, addiction treatment, newborn nursery, inpatient pediatrics, intensive care nursery, pediatric intensive care, outpatient primary care settings via: ○ One-on-one "onboarding" with new staff ○ In-person group education in staff/provider meetings, lunch-and-learns, dinner workshops ○ on-line education • Provide dinner workshop for Pedi, Newborn Nursery, NICU, OB, Addiction treatment, etc. staff/providers • Identify staff/provider champions for each care setting / units • Validate concerns • Provide articles and resources on model of care (see key readiness checklist) • Perform case reviews of infants with NAS/NOWS
PRENATAL EDUCATION	
Prenatal Education – difficulties in educating moms prior to delivery / accessing patients and/or best way to deliver education	• Educate prenatal clinics / treatment program on benefits of education moms ahead of time (e.g., parental preparation /

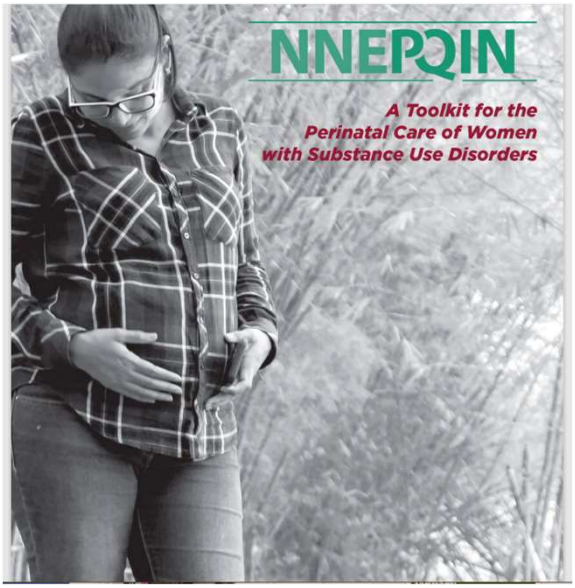
2.19.20 Bonny Whalen MD and Farrah Deselle MSN, RN

NNEPQIN NORTHERN NEW ENGLAND PERINATAL QUALITY IMPROVEMENT NETWORK

Not enough volunteers/cuddlers	• Consider non-pharm care/holding by anyone that is available that day / that moment: • RN, LNA, administrative staff • Student nurses • Medical students • Home visitor, doula, DCYF, social work (when appropriate/parent permission) • Work with volunteer program in hospital to train additional cuddlers; reach out to retired nursing/provider staff for availability / interest • Outreach to community organizations
Birthing unit / facility not set up for rooming-in or extended parental stay	• Explore pediatric unit or other alternatives • Provide comfortable/reclined seating & sleep space for lengthy parent stays • Provide wraps for parents/staff/other cuddlers • Provide meal / travel vouchers • Provide parent / caregiver meal trays • If hospital not set up to provide these resources, try to secure grant funding as available in hospital / community
Restrictive Policies	• Provide staff education on harm reduction and trauma-informed care • Provide staff education on science of addiction and principles of recovery • Consider ethics consult prn • Provide prenatal education/preparation for hospital stay including info on visitation, curfew, searches etc. • Family check in q day/shift to keep communication open and transparent
FAMILY CHALLENGES	
Limited parental presence	• Provide comprehensive prenatal education that includes benefits of parental presence with decreased need for pharm Rx + shorter LOS; discuss importance of having at least one support person available to take turns caring for baby and planning for maternal/caregiver rest with cuddlers/other family and friend support • Provide addiction Rx providers (who care for pregnant women) with ESC information and prenatal education handouts that include importance of parental presence • Additionally educate mother/family re: above upon maternal admission for labor and/or birth of baby • Communicate with compassion and provide supportive non-judgmental care for parents, when present, so that they feel welcomed and valued in care of their newborn • Provide cuddlers when parents not available/present, requesting permission as needed/indicated

2.19.20 Bonny Whalen MD and Farrah Deselle MSN, RN

Other ongoing important and impactful work contributing to improved care for dyads with perinatal opioid exposure in our region

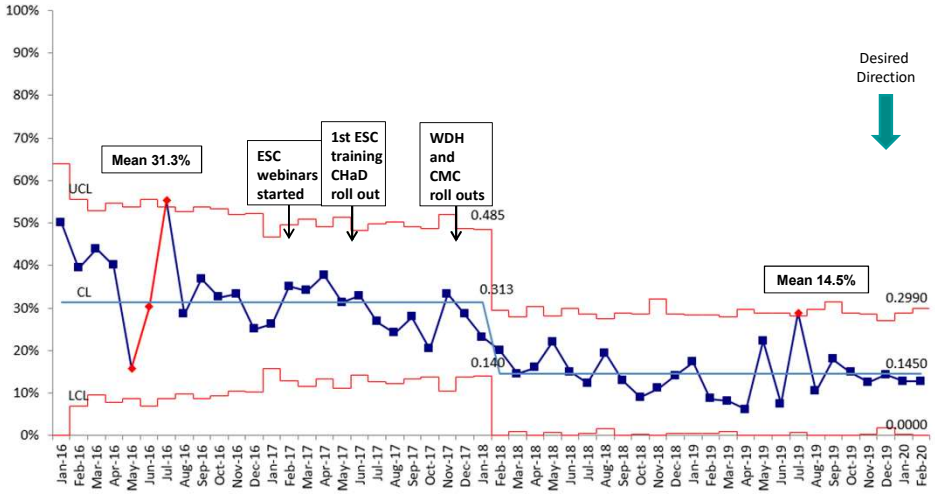


NNEPQIN_Toolkit_final.pdf

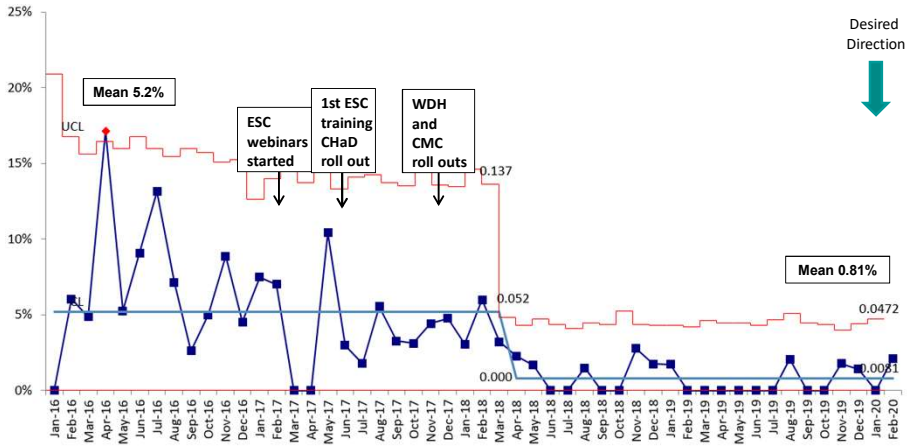
NNEPQIN ESC Hospital Status Updates

- **> 70 Northern New England hospitals have been formally trained in and have implemented the ESC Care Tool** through NNEPQIN, MA's PNQIN, MaineHealth
  - **NH:** 17/17
  - **ME:** 24/27
  - **VT:** 10/11
  - **MA:** 20/37
- **24 NNEPQIN hospitals submit data to REDCap** to help formally track outcomes for their OENs
  - **NH:** 11
  - **VT:** 5
  - **ME:** 8
- **As of Feb 2020: 2568 babies in NNEPQIN database**

Statistical Process Control Chart:
Percent of Opioid Exposed Newborns ≥ 35 weeks Receiving Pharmacologic Treatment
Jan 2016 to Feb 2020 (n = 2568 newborns)



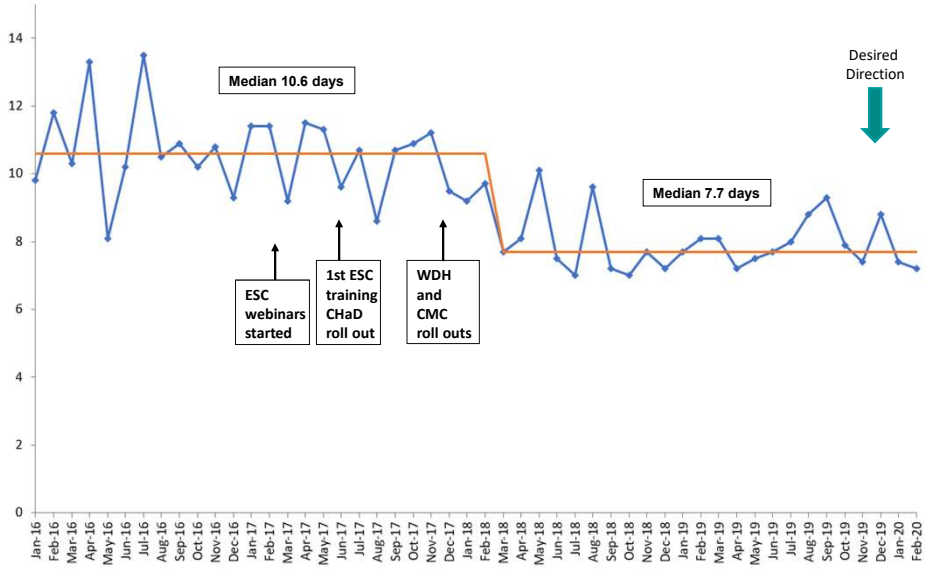
P Chart:
Percent of Opioid Exposed Newborns ≥ 35 weeks Receiving 2nd Pharm Agent
Jan 2016 to Feb 2020 (n = 2568 newborns)



Run Chart:

Length of Hospital Stay for all Opioid-Exposed Newborns ≥ 35 weeks

Jan 2016 to Feb 2020 (n = 2568 newborns)



Run Chart:

Length of Hospital Stay for Opioid Exposed Newborns ≥ 35 weeks Receiving Pharmacologic Treatment

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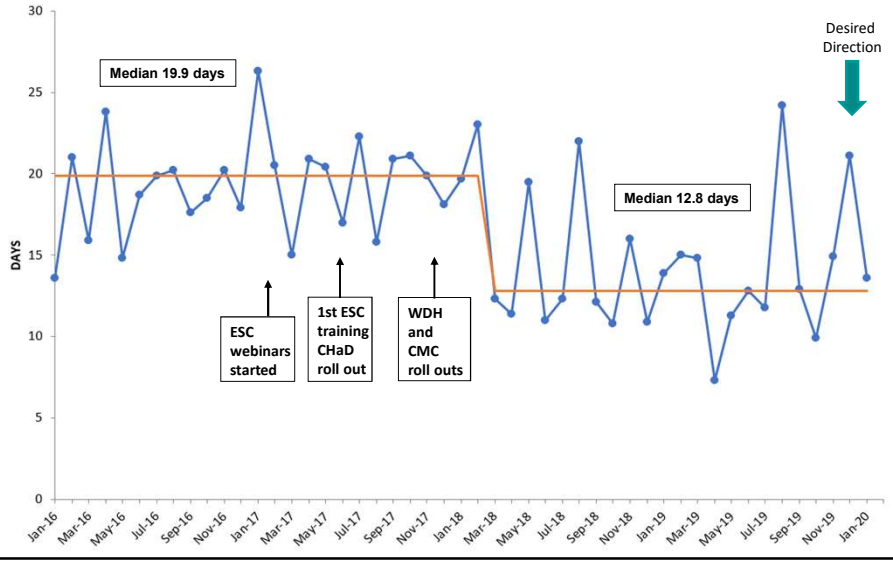
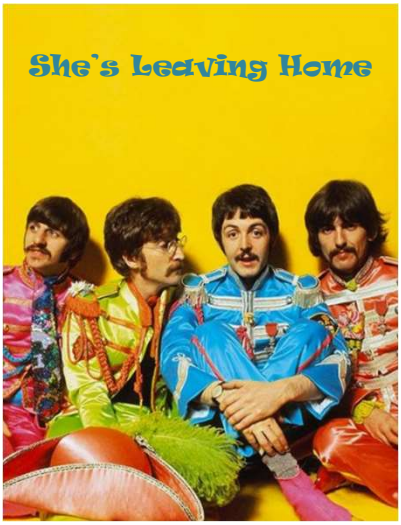


Questions that Remained and Potential Impact of ESC Care Tool Implementation via ACT NOW National Trial & other PQCs



- **Is use of the ESC Care Tool generalizable to other hospital settings?**
  - Lower rates of maternal MAT/MOUD?
  - Higher rates of polysubstance use?
  - Lack of access/staff to provide prenatal education?
  - Lower rates of parental presence and rooming-in?
- **Need to look at short, mid- and longer-term clinical outcomes:**
  - In-hospital & post-hospital outcomes
    - Potential adverse effects/events
    - Maternal-infant attachment
    - Family stress
    - Infant neurodevelopment

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Eat, Sleep, Console Approach or Usual Care for Neonatal Opioid Withdrawal

Young et al; ACT NOW Collaborative. *N Engl J Med. 2023.*

- **Cluster-randomized controlled trial**
- **26 US hospitals**
- **Infants ≥ 36 weeks with in-utero opioid exposure**
- **"Usual care" with Finnegan → ESC Care Tool intervention**
- **3 month transition period:**
  - **Train the trainer via virtual sim trainings → Staff training at home**
  - **Inter-rater reliability testing**
    - 100% IRR for "Gold Star Raters"
    - 80% for bedside RNs

Outcome Measures

- **Primary outcome:** Time from birth till medically ready for discharge = *at least:*
  - 96 hr of age
  - 48 hr w/out opioid Rx
  - 24 hr w/out respiratory support
  - 24 hr with 100% oral feeding and from initiation of max caloric density
- **Secondary outcomes:**
  - Mean length of stay
  - Proportion of infants who received opioid Rx
- **Composite safety measures:**
  - In-hospital safety (seizures or accidental trauma, respiratory insufficiency attributed to opioid Rx)
  - Unscheduled health care visits (any acute/urgent care visit, ED visit, hospital readmission)
  - Non-accidental trauma/death

- **1305 infants enrolled**
  - **Usual care:** 702
  - **ESC:** 603
- **In ITT analysis, 837 infants** met trial definition for medical readiness for dc
  - **ESC:** 8.2 days
  - **Usual care:** 14.9 days
  - **Adj mean diff:** 6.7 days
    - 95% CI: 4.7-8.8
  - **Rate ratio:** 0.55
    - 95% CI: 0.46-0.65

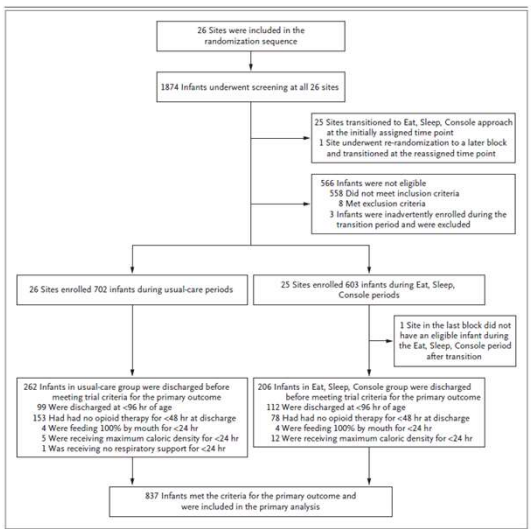


Figure 2. Enrollment, Randomization, and Analytic Sample.

Secondary Outcomes

- **Mean LOS:**
  - **ESC:** 7.8 days
  - **Usual care:** 14.0 days
  - **Mean diff:** 6.2 days (95% CI, 4.6-7.7)
  - **Rate ratio:** 0.56 (95% CI, 0.49-0.64)
- **Proportion of infants who received opioid Rx:**
  - **ESC:** 19.5%
  - **Usual care**: 52%
  - **Absolute diff:** 32.5%
  - **Relative risk:** 0.38 (95% CI, 0.30-0.47)

Composite Safety Measures

- **Similar risk b/w groups at d/c and through 3 months of age**
- **Through 3 months of age:**
  - **ESC:** 16.1%
  - **Usual care:** 15.8%
  - **RR:** 1.02 (95% CI, 0.71-1.47)

PDSA 32 (2020 …): Foundational Components and Reading / Resource List for Implementing the ESC Care Tool/Approach in the Care of Opioid-Exposed Newborns

Foundational Components and Reading/Resource List for Implementing the ESC Care Tool©/Approach in the Care of Opioid-Exposed Newborns

The following list outlines foundational components of the ESC Care Approach. We understand that prenatal education and rooming-in may not be attainable in all clinical settings, but feel they should be prioritized when available and that all non-pharmacologic care interventions be implemented to their greatest extent possible in your hospital's individual care settings for each and every baby.

FOUNDATIONAL COMPONENTS:

1. **Prenatal Education & Preparation of Mothers/Families** to be their Newborn's First Line Treatment for NOWS
2. **Prioritization/Optimization of Non-pharmacologic Care** as First Line Treatment for NOWS in All Care Settings
3. **Rooming-in and Mother-Baby Couplet Care** When & Where Available
4. **Promotion of Parental Presence & Engagement in Care** with Parent/Caregiver Huddles & Shared Decision Making
5. **Promotion of Skin-to-Skin & Breastfeeding** (Unless Medical Contraindications Exist)
6. **Baby-centered NOWS Assessments & Clustered Care** around the Baby's Sleep/Wake/Feed Cycle
7. **Function-based Symptom Prioritization & Full Care Team Huddles for Pharmacologic Treatment Decisions**
8. **Use of a Standardized Non-pharmacologic Care Bundle & Pharmacologic Treatment Protocol** to Promote Consistent Evidence-based Care Among All Perinatal Clinic & Hospital Staff
9. **Staff Trained & Reliable in Bedside NOWS Assessments** Using a Standardized, Structured Assessment Tool
10. **All Perinatal Staff Trained in Trauma-informed, Compassionate Care**
11. **Development of a Plan of Safe/Supportive Care for Safe & Healthy Transitions to Home**

As you consider implementing the ESC Care Tool in your hospital's care of opioid-exposed newborns, we recommend that you review the following articles supportive of the ESC Care Approach to help you understand the reasoning and evidence behind recommendations for many of the foundational components, in order of year of publication. ***For those with limited time, we have starred (*) high-yield recommended readings/resources.***

KEY READINGS/RESOURCE LIST

Implementing the ESC Care Approach/Tool

- *Grossman MR, Berkwitt AK, Osborn RR, et al. **An initiative to improve the quality of care of infants with neonatal abstinence syndrome.** *Pediatrics*. 2017;139: e20164460. https://pediatrics.aappublications.org/content/pediatrics/139/6/e20163360.full.pdf
- *Grossman MR, Lipshaw MJ, Osborn RR, Berkwitt AK. **A novel approach to Assessing Infants with Neonatal Abstinence Syndrome.** *Hosp Pediatr*. 2018 Jan;8(1):1-6. https://hosppeds.aappublications.org/content/hosppeds/8/1/1.full.pdf
- Wachman EM, Grossman M, Schiff DM, et al. **Quality improvement initiative to improve inpatient outcomes for Neonatal Abstinence Syndrome.** *J Perinatol*. 2018;38:1114-1122. https://hosppeds.aappublications.org/content/hosppeds/early/2019/07/25/hpeds.2019-0144.full.pdf
- *Wachman EM, Houghton M, Melvin P, et al. **A quality improvement initiative to implement the eat, sleep, console neonatal opioid withdrawal syndrome care tool in Massachusetts' PNQIN collaborative.** *J Perinatol*. 2020;1-10. https://dh.sharefile.com/d-s7459c270f4fa4fbfa2852d7208ed3b71
- *Young LW, Ounpraseuth ST, Merhar SL, et al; ACT NOW Collaborative. Eat, Sleep, Console Approach or Usual Care for Neonatal Opioid Withdrawal. *N Engl J Med. 2023*. Epub ahead of print. PMID: 37125831.

PDSA 33 (2021): Revisions of ESC Care Tool based on PQC/ACT NOW trial feedback & lessons learned

Boston Medical | Yale New Haven Children's Hospital | CHaD Children's Hospital at Dartmouth-Hitchcock

EAT, SLEEP, CONSOLE (ESC) CARE TOOL 3rd edition v.4.2021

- **Review ESC behaviors, signs of withdrawal, 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 are currently being implemented well (**"R"**), **coach** in ways **other NPIs** can **be increased now** ("E"), **and educate** in ways to increase in the **future** ("E").
- If **Yes** for any **ESC** item *or 3* for **Consoling Support Needed**: Perform a **Formal Parent/Caregiver Huddle**.
- If 2nd **Yes in a row** for the same **ESC** item *or* 2nd **3 in a row** for **Consoling Support Needed** *AND* **NPIs maximized** for infant's current clinical setting *OR* if **other significant concerns** are present: Perform a **Full Care Team Huddle**.

See back of ESC Care Tool for tool item definitions & details regarding Formal Parent Caregiver and Full Care Team Huddles

Perform assessment of ESC behaviors, signs of withdrawal, and NPIs for time period since last ESC assessment – note date/time:	
NOWS/NAS RISK ASSESSMENT	
Are signs specific for withdrawal present? (e.g., hyperactive startle/Moro, disturbed & undisturbed tremors, hypertonia, excessive/disorganized suck, watery stools, continuous crying/excessive irritability in absence of other etiology) Yes / No	
If Yes, in 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 other significant concerns present? (e.g., apnea, seizures, excessive caregiver sleepiness) Yes / No / Unsure	
Are NPIs maximized to fullest extent possible in infant's current clinical setting? Yes / No / Unsure	
EATING	
Takes > 10 min to coordinate feeding *or* **breastfeeds < 10 min** *or* **feeds < 10 mL** *(or other age-appropriate duration/volume)* **due to NOWS?** Yes / No	
SLEEPING	
Sleeps < 1 hr due to NOWS? Yes / No	
CONSOLING	
Takes > 10 min to console *(or* **cannot stay consoled for** *at least* **10 min) due to NOWS?** Yes / No	
Consoling Support Needed *(assessed independent of NOWS)* 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	
CARE PLAN	
Formal Parent/Caregiver Huddle Indicated to formally review/NPIs to be increased further? Yes / No / NA (choose NA if Full Care Team Huddle indicated in this includes Parent/Caregiver).	
Full Care Team Huddle Indicated to formally discuss ESC difficulties and/or other significant concerns present, consider all possible etiologies for symptoms, re-assess if NPIs are maximized, and determine if NOWS pharmacologic treatment or other changes in management are needed? Yes / No	
Management Decision a: **Continue/Optimize NPIs** b: **Initiate NOWS Pharmacologic Treatment** (please list medication initiated) c: **Continue NOWS Pharmacologic Treatment** d: **Other** (please describe - e.g. LC & or OT/PT Consult, Start 2nd Pharm Agent [indicate name], Increase, Wean or Stop Medication)	
PARENT/CAREGIVER PRESENCE SINCE LAST ASSESSMENT	
> 3 hours (includes if parent/caregiver present entire time), **2-3 hours, 1-2 hours, < 1 hour, 0 hours** (no parent/caregiver present)	
NON-PHARM CARE INTERVENTIONS (I = Increase Now, R = Reinforce, E = Educate for Future, NA = Not Applicable/Available)	
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, DCYF worker)	
Limiting # of visitors & duration of visit(s) 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 baby as parents not available or able to safely care for baby; other NPIs [please describe])	

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DEFINITIONS

EATING

- **Takes > 10 min to coordinate feeding** *or* **breastfeeds < 10 min** *or* **feeds < 10 mL** *(or* other age-appropriate duration/volume*)* **due to NOWS:** 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., increased Moro, disturbed/undisturbed tremors, continuous crying/excessive irritability in absence of other etiology, 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 spitiness in first 24 hours, inability to latch due to infant maternal anatomical factors).

SLEEPING

- **Sleep < 1 hour due to NOWS:** Baby **unable to sleep for** *at least* **one hour**, after feeding well, **due to opioid withdrawal symptoms** (e.g., increased Moro, disturbed/undisturbed tremors, continuous crying/excessive irritability in absence of other etiology).
- *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

- **Takes > 10 min to console** *(or* **cannot stay consoled for** *at least* **10 min) due to NOWS:** Baby **takes longer than 10 minutes to console** *OR* **cannot stay consoled for** *at least* **10 minutes** *(***due to opioid withdrawal symptoms***)* **despite** infant caregiver/provider's **best efforts to implement NPIs** (e.g., skin-to-skin contact, non-nutritive sucking when baby not hungry).
- *Special Note:* **Do not indicate Yes** if infant's difficulties consoling are clearly **due to non-opioid related factors** (e.g., caregiver non-responsiveness to infant hunger cues, circumcision pain, discomfort due to severe diaper rash).

CONSOLING SUPPORT NEEDED *(assessed independent of NOWS)*

1. **Able to console on own:** Able to console on own without any caregiver support needed.
2. **Able to console within (and stay consoled for) 10 min with caregiver support:** Baby with absence of crying, grimacing, or other signs of distress while being held (or otherwise consoled) by a caregiver.
3. **Takes > 10 min to console** *(or* **cannot stay consoled for** *at least* **10 min) despite caregiver's best efforts:** Baby with presence of crying, grimacing, squirming/moving, or other signs of distress despite a caregiver's best efforts to implement recommended NPIs (e.g., parent/caregiver presence, skin-to-skin, holding, safe swaddling, optimal feeding, non-nutritive sucking when not hungry).

CARE PLAN

- **Formal Parent/Caregiver Huddle**: **RN bedside huddle** with **parent/caregiver** *(at minimum) to formally* **review NPIs that can be increased now (I)** to help with current ESC difficulties. To be performed if infant receives **Yes** for any **ESC** item *or* **3** for **Consoling Support Needed**.
- **Full Care Team Huddle: Formal huddle** with **parent/caregiver, RN** *and* **infant provider** *(at minimum)* to 1) **discuss ESC difficulties** and/or **other significant concerns** present, 2) **consider all potential etiologies** for symptoms, 3) **re-assess if NPIs are maximized** to fullest extent possible **in infant's current clinical setting**, *AND* 4) **determine if NOWS pharmacologic treatment** *or* **other changes in management** are needed *(e.g. evaluation for sepsis, initiation of nasogastric feedings for uncoordinated feeding)*. Huddle to be performed if a) infant **receives 2nd Yes in a row** for the **same ESC item** *or* **2nd 3 in a row** for **Consoling Support Needed** *AND* **NPIs are maximized for infant's current clinical setting** *OR* b) **if other significant concerns** are present *(e.g., seizures, apnea, persistent tachypnea causing fatigue in the infant, excessive weight loss despite optimal feeding, excessive caregiver sleepiness, new or imminent concern about discharge safety)*.

Management Decision:

- Consider **NOWS Pharm Treatment** if a) baby with **2nd Yes in a row** for the **same ESC item, signs of withdrawal are present, and timing is consistent with known opioid** exposure *AND* Full Care Team Huddle reveals that **NPIs are maximized** to fullest extent possible in infant's current clinical setting *OR* b) **severe symptoms are present** *AND* symptoms **may be due to NOWS** *(e.g., seizures, apnea)*. When medication is started, perform ESC Care Tool reassessment in ~3 hrs to determine if additional medication dosing is needed.

PARENT/CAREGIVER PRESENCE SINCE LAST ASSESSMENT: Time (in hours) since last assessment that parent (or other caregiver) spent together with infant in own room or in Nursery.

OPTIMAL FEEDING:

- **Baby feeding** *at early* **hunger cues and until content** without any limit placed on duration or volume of feeding. Feedings are encouraged **at least every 3 hours, optimally 8-12 times per day**, to ensure baby does not become too hungry or disorganized with feeding and to optimize nutritional intake. A baby may remain sleeping for more than 3 hours *for therapeutic rest* if feeding difficulties or excessive weight loss are *not* present. If a pacifier is used, it should be introduced only after a baby has been fed or offered a feeding. As infants with NOWS may have poor feeding, have excessive/watery stools, or be hypermetabolic, **closely follow daily weight** and **provide increased volume and/or caloric density** of feedings, as needed, **for more than expected weight loss** *and/or* **poor weight gain for age**. Consider nasogastric feedings as needed.
- **Breastfeeding:** Baby latching deeply with comfortable latch for mother, and sustained active suckling for baby with only brief pauses noted. **If feeding difficulties present**: a) **assist directly with breastfeeding** to help achieve more optimal latch and position, b) **demonstrate hand expression** and have mother express colostrum **prior to and/or during feedings**, and/or c) have baby feed on a clean or gloved adult finger first to **organize suck prior to latching**. As able based on infant's symptoms, consider withholding pacifiers until babies are breastfeeding well due to the potential to interfere with a good latch/suck. Consider use of nipple shield to facilitate palatal stimulation, or supplementation at the breast (as tolerated by mother), if infant requires assistance to maintain latch/suck. If significant difficulties continue and baby unable to maintain latch/suck, consider initiation of alternative feeding method *(e.g., bottle feeding, nasogastric feedings)*.
- **Bottle feeding:** Baby effectively coordinating suck and swallow without gagging or excessive spitting up. **If feeding difficulties are present**: a) assess **need for altered nipple shape/flow rate**, b) instruct parent to **provide chin support during feedings**, *and/or* c) **modify position of bottle and flow of milk** to assist baby with feeding (e.g., modified side-lying position).
- **Consult a feeding specialist** (e.g., lactation, speech therapy, feeding team) when **feeding difficulties are present**.

Summary of 3rd ed. changes for improved ESC Care Tool IRR

Overview Instructions:

- Modified wording for **2nd Yes in a row** from 'any single ESC item' → **the same ESC item**
- Clarified for **2nd 3 in a row for CSN**
- Specified NPIs maximized for infant's **current** clinical setting

NOWS/NAS Risk Assessment:

- Added signs **specific** for withdrawal
- Specified NPIs maximized to fullest extent possible in infant's **current** clinical setting
- Added '**Are other significant concerns present?'** to aid in care plan mgmt. decision making

ESC/CSN Assessments:

- NOWS/NAS → **NOWS** alone
- CSN: *Assessed **independent** of NOWS*

FPCH + FCTH Care Plan Decisions:

- **Moved instructions** to back side **Definitions**
- Changed Huddle 'Performed' to **Indicated**
- **FPCH:** Added '**NA (choose NA if Full Care Team Huddle indicated as this includes Parent/Caregiver)'**
- **FCTH:** Specified **actions for huddle**

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EAT, SLEEP, CONSOLE (ESC) CARE TOOL 3rd edition

- **Review ESC behaviors, signs of withdrawal,** 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 are currently being implemented well **("R")**, **coach** in ways **other NPIs** can be **increased now ("I")**, and **educate** in ways to increase in the **future ("E")**.
- If Yes for any ESC item *or* 3 for **Consoling Support Needed:** Perform a **Formal Parent/Caregiver Huddle**.
- If **2nd Yes in a row** for **the same ESC** item *or* **2nd 3 in a row** for **Consoling Support Needed** *AND* **NPIs maximized** for infant's current clinical setting *OR* if **other significant concerns** are present: Perform a **Full Care Team Huddle**.

See back of ESC Care Tool for tool item definitions & details regarding Formal Parent Caregiver and Full Care Team Huddles

Perform assessment of ESC behaviors, signs of withdrawal, and NPIs for time period since last ESC assessment – note date/time:	
NOWS/NAS RISK ASSESSMENT	
Are signs specific for withdrawal present? (e.g., hyperactive startle/Moro, disturbed & undisturbed tremors, hypertonia, excessive disorganized suck, watery stools, continuous crying/excessive irritability in absence of other etiology) 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 other significant concerns present? (e.g., apnea, seizures, excessive caregiver sleepiness) Yes / No / Unsure	
Are NPIs maximized to fullest extent possible in infant's current clinical setting? Yes / No / Unsure	
EATING	
Takes > 10 min to coordinate feeding *or* **breastfeeds < 10 min** *or* **feeds < 10 mL** (*or* other age-appropriate duration/volume) **due to NOWS?** Yes / No	
SLEEPING	
Sleeps < 1 hr due to NOWS? Yes / No	
CONSOLING	
Takes > 10 min to console (*or* **cannot stay consoled for** *at least* **10 min) due to NOWS?** Yes / No	
Consoling Support Needed *(assessed **independent** of NOWS)* **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	
CARE PLAN	
Formal Parent/Caregiver Huddle Indicated to formally review NPIs to be increased further? Yes / No / NA (choose NA if Full Care Team Huddle indicated as this includes Parent/Caregiver)	
Full Care Team Huddle Indicated to formally discuss ESC difficulties and/or other significant concerns present, consider all possible etiologies for symptoms, re-assess if NPIs are maximized, and determine if NOWS pharmacologic treatment or other changes in management are needed? Yes / No	
Management Decision **a: Continue/Optimize NPIs** **b: Initiate NOWS Pharmacologic Treatment** (please list medication initiated) **c: Continue NOWS Pharmacologic Treatment** **d: Other** (please describe - e.g., LC &/or OT/PT Consult, Start 2nd Pharm Agent [indicate name]; Increase, Wean or Stop Medication)	

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PDSA 34 (2021): Additional Key Resources to Optimize ESC Care Tool IRR

Key Resources to Optimize your Inter-Rater Reliability using the 3rd edition ESC Care Tool

Following for Signs/Symptoms of NOWS & Considering Other Etiologies

CNS Hyperexcitability	Autonomic Dysregulation	Gastrointestinal Dysfunction
High-pitched or continuous crying / excessive irritability*	Fever*	**Excessive sucking**
Decreased sleep	**Sweating**	**Poor / disorganized feeding**
Hyperactive Moro/startle	**Nasal stuffiness**	**Regurgitation or projective vomiting***
Disturbed / undisturbed tremors	**Sneezing**	**Loose or watery stools**
Hypertonia	**Tachypnea***	
Myoclonic jerks		
Seizures*		

Hyperactive Moro + **undisturbed tremors** + **increased tone** are 3 items that have been found to discriminate b/w opioid and non-opioid exposed infants - Jones et al. *J Opioid Manag.* 2010.

Bolded items = those found in "short forms" to be correlated to withdrawal symptoms *(though does not necessarily mean opioid withdrawal)*

* **Items:** Perform careful history, exam, and labs/imaging as needed to r/o other etiologies *(e.g., hypoglycemia, infection, pulmonary pathology, GI obstruction, CNS injury)*

Determining Yes Responses for ESC Items

Indicate Yes for any ESC item if infant:

1. **Meets definition for that ESC assessment item** *AND*
2. **Receives a Yes response to the first two items** of the **NOWS/NAS RISK ASSESSMENT** *(i.e., specific sx of w/d present & timing consistent w/ known exposure)*

EATING Example: 2.5 day old with mild tremors and hypertonia with in-utero methadone and SSRI exposure. Takes > 10 min to coordinate latch and only breastfeeds for 5 min before unlatching due to uncoordinated sucking and excessive rooting. Able to sleep for 1.5 – 2 hr at a time. Consoles easily within 5 min and remains consoled as long as is held

NOWS/NAS RISK ASSESSMENT	
Are signs specific for withdrawal present? Yes – mild tremors, hypertonia, uncoordinated sucking, excessive rooting	**Yes**
If Yes, is timing of withdrawal consistent with known opioid exposure? Yes, 2.5 days old & methadone-exposed	**Yes**
Are co-exposures present that may be contributing to signs of withdrawal? SSRI: But should be getting better by 2.5 days?	**Unsure**
Are NPIs maximized to fullest extent possible in infant's current clinical setting? Yes / No / Unsure	
Are significant concerns present? (e.g., apnea, seizures, excessive caregiver sleepiness) Yes / No / Unsure	**No**
EATING	
Takes > 10 min to coordinate feeding *or* **breastfeeds < 10 min** *or* **feeds < 10 mL** (*or* other age-appropriate duration/volume) **due to NOWS?** Takes > 10 min to coordinate latch, only BF for 5 min before unlatching due to NOWS	**Yes**
SLEEPING	
Sleeps < 1 hr due to NOWS? Sleeping in 1.5-2 hr stretches	**No**
CONSOLING	
Takes > 10 min to console (*or* cannot stay consoled for *at least* 10 min) due to NOWS? Consoles within 5 min/stays consoled	**No**
Consoling Support Needed *(assessed **independent** of NOWS)* **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	**2**

Determining No Responses for ESC Items

Indicate No for ESC assessment item if:

- ✓ **Signs specific for withdrawal** are **absent**
- ✓ **Timing of withdrawal** is **not consistent** with **known/suspected opioid exposure**
- ✓ **Definition** for **ESC assessment item** is **not met**
- ✓ **Eating, sleeping, consoling difficulty** is **assessed** to be **due to non-opioid related factors**
  (e.g., fussiness from continued hunger with sx quickly resolving with feeding, pain from diaper rash in absence of w/d sx)

2 day old full term **suboxone-exposed** newborn **w/out other exposures**. **Mild jitteriness, tremors, and fussiness** with diaper changes. Calms with picking up & holding. Tone + Moro normal. **Breastfed well x 20 min**, taking only **few min to latch**. Fell asleep after feeding. **Awake again in ~1-1.5 hours**, cueing to feed. **Breastfed again x 30 min, latching within few min of calming**. **Content & calm after feeding in mom's arms.**

Perform assessment of ESC behaviors, signs of withdrawal, and NPIs for time period since last ESC assessment *– note date/time:*	
NOWS/NAS ASSESSMENT	
Are signs specific for withdrawal present? ***Jittery & fussy w/ diaper change, mild tremors & fussiness on exam; tone/Moro currently normal***	**Y**
If Yes, is timing of withdrawal consistent with known opioid exposure? ***Yes – mom on suboxone and baby 2 days old***	**Y**
Are co-exposures present that may be contributing to signs of withdrawal? Yes / No / Unsure (please list co-exposures)	**N**
Are NPIs maximized to fullest extent possible in infant's current clinical setting? Yes / No / Unsure	**N**
Are significant concerns present? (e.g., apnea, seizures, excessive caregiver sleepiness) Yes / No / Unsure	**N**
EATING	
Takes > 10 min to coordinate feeding *or* **breastfeeds < 10 min** *or* **feeds < 10 mL** (*or* other age-appropriate duration/volume) **due to NOWS?** ***No – Breastfed well x 20 min & again for 30 min ~1-1.5 hrs later, taking only a few min to latch each time. Mom w/ some mild pain but baby content. Baby a little sleepy with 2nd feeding. Frequent & sl. sleepy feedings assessed likely physiologic for age.***	**N**
SLEEPING	
Sleeps < 1 hr due to NOWS? ***No - Awoke in ~1-1.5 hrs, cueing to feed; waking assessed due to physiologic cluster feeding.***	**N**
CONSOLING	
Takes > 10 min to console (*or* **cannot stay consoled for** ***at least*** **10 min) due to NOWS?** ***No – fussy after waking & with diaper changes but consoles w/ in 3-5 minutes w/ STS & stays consoled when held.***	**N**

All Nos as definitions not met

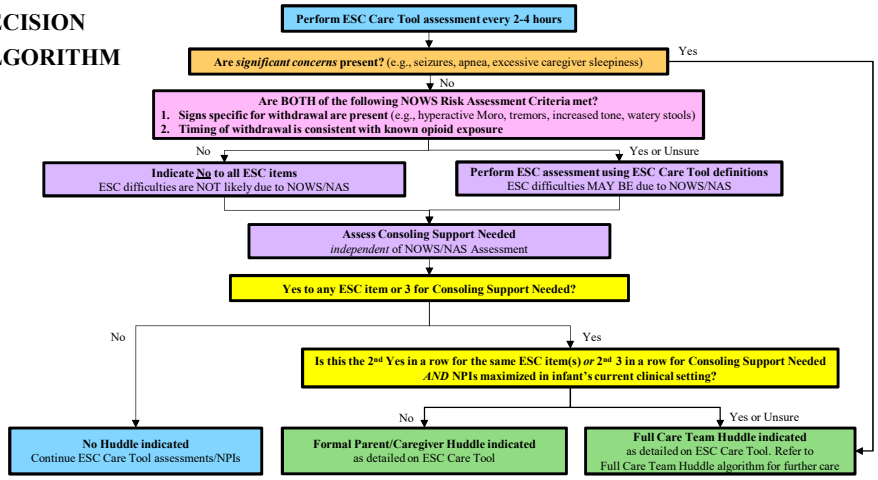
Differentiating Hunger vs NOWS in Setting of Eating & Consoling Difficulties

Ask the following questions:

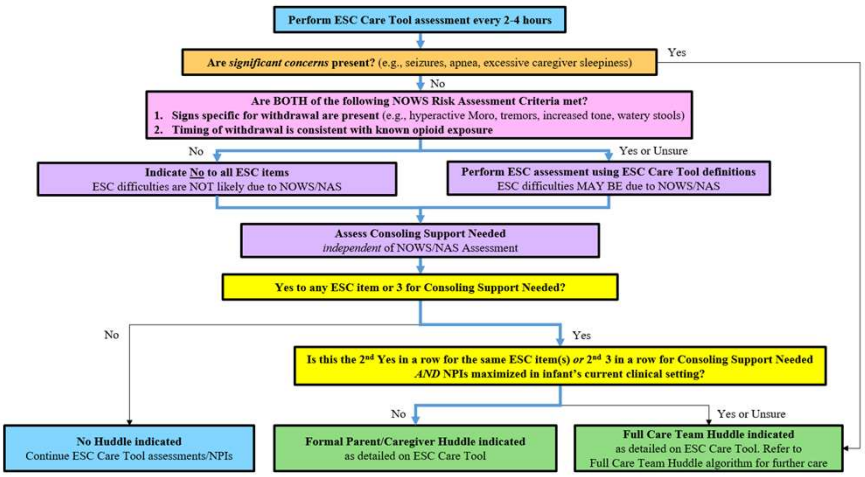
- **Do symptoms readily resolve following appropriate responsiveness to infant's feeding cues?**
  - If yes: **Symptoms are more likely due to hunger alone than NOWS**

- **Is infant having difficulty coordinating feeding only** *or* **is the infant having difficulties coordinating feeding** *AND* **difficulties consoling?**
  - If difficulties with both E+C and other more specific signs of withdrawal are present *(e.g., hyperactive Moro, tremors, hypertonia)*: **Symptoms are more likely due to NOWS than hunger alone**

ESC Care Tool Management Decision Algorithm



When Formal Parent/Caregiver Huddles are Indicated



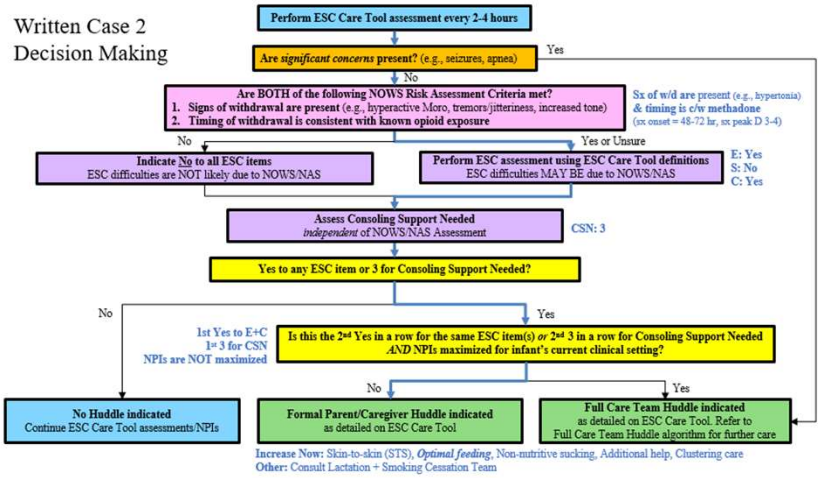
Newborn Care Diary

Baby's Name: _____ Days of Age: _____ Baby's Med Record #:_____

Eating				Sleeping			Consoling	Voiding / Stooling		Extra Comments
Time of baby's feeding (start to finish)	Breast feeding (total # minutes)	Bottle feeding (total # mL)	Was baby able to feed well within 10 min of showing hunger? (If no, please describe)	Time when baby fell asleep	Time when baby woke up	Did baby sleep for one hour or more? (If no, please describe)	Did baby console within 10 min & stay consoled for *at least* 10 min? (If no, please describe)	Check box for pee	Check box for poop (please describe)	Share any extra symptoms you have seen or concerns/needs that you have to help care for your baby

PDSA 35 (2023): Updating written cases for latest ESC Care Tool to include detailed answer key and mgmt decision algorithms

Written Case 2
Decision Making



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  - Elisha Wachman and Susan Minear – Boston Medical Center
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  - ME: Alan Picarillo, Kelley Bowden
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- **Our statistical/QI support team:** Alan Picarillo, Kate MacMillan, Meagan Stabler

**Special Note:* Dr. Grossman has asked to be removed from ESC Care Tool copyright

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…. and to any others not mentioned here that should have been!