



Neonatal Opioid Withdrawal Syndrome Initiative

Hospital Team Toolkit

Neonatal Opioid Withdrawal Syndrome (NOWS), formerly known as Neonatal Abstinence Syndrome (NAS), refers to the collection of signs and symptoms that may occur in opioid-exposed newborns shortly after birth. Between 2010 and 2013, the number of infants with NOWS doubled with a total cost exceeding \$23 million in Alabama. The ALPQC aims to reduce variation in treatment and optimize the care of infants with NOWS through compassionate withdrawal treatment with the goal of optimizing nonpharmacologic management, pharmacologic management, and providing a safe discharge for these infants and mothers.

The toolkit primarily utilizes evidence-based and standard practices used by other perinatal quality collaboratives. We recognize that each hospital is unique, and not all of these factors need to be addressed in every facility. Therefore, it is important to use this toolkit to determine what might be relevant to your facility.

Step 1 – Form your QI team:

- Your team should contain at least one physician champion, one nurse champion, one pharmacy champion, and one data champion (someone with access to medical charts).

Step 2 – Identify gaps, goals, and next steps:

- Review the toolkit/checklist as a team to:
 - understand best practices
 - identify current gaps & determine action steps needed
 - assign someone to be responsible for championing and managing each action

Step 3 - Identify area(s) for intervention

- Create a 30-60-90-day plan to decide what to accomplish in the first 3 months
- Develop protocols, or tweak existing ones, to meet goals

Step 4 – Ensure success

- Determine method for gathering data to monitor project success
- Establish QI team meeting schedule (may be bimonthly at first and then monthly)
- Commit to participate in monthly ALPQC project webinars



Neonatal Opioid Withdrawal Syndrome Initiative

Hospital Team Toolkit

ALPQC NOWS Project Checklist

Action and Resources	Current Assessment (<i>Select one</i>)		Responsible Person
<p>1. Ensure appropriate education for all staff on how to discuss patient care with families of infants with NOWS. The use of appropriate language (e.g. not labeling someone as an “addict”) and conveying respect may reduce stigma around NOWS and reduce social barriers so as to provide the best care possible for these infants.</p> <p>Resources: www.stopjudging.org www.beyondlabels.marchofdimes.org</p>		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	
<p>ALPQC Structure Measure #1: Number of hospitals with education practices “in place” for hospital staff for stigma reduction ALPQC Outcome Measure: % of infants with NOWS \geq 36 weeks with evidence of opioid withdrawal</p>			
<p>2. Ensure appropriate education for all staff on withdrawal scoring in opioid exposed newborns (OENs) – Finnegan Scoring and Eat, Sleep, Console are the 2 primary ways in which OENs are assessed during their hospital stay. Staff training should occur at initial hiring and in annual competency training. Hospitals should also conduct simulations or drills.</p> <p>Resources: NOWS Toolkit Withdrawal Scoring</p>		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	
<p>ALPQC Structure Measure #2: Number of hospitals with education practices “in place” for hospital staff for scoring opioid exposed newborns</p>			
<p>3. Need to standardize non-pharmacologic guidelines for opioid-exposed newborns (OENs) – Care of OENs starts with nonpharmacologic interventions prior to considering medication. Development of guidelines should consider:</p> <ul style="list-style-type: none"> • Available resources (e.g. rooming-in, volunteers, mamaroos) • Environmental optimization (e.g. clustered care, visitor limitation) • Education on practices (e.g. feeding, soothing methods) 		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	



Neonatal Opioid Withdrawal Syndrome Initiative

Hospital Team Toolkit

Resources: NOWS Toolkit Nonpharmacologic Management			
ALPQC Process Measure: % of infants with NOWS \geq 36 weeks receiving nonpharmacologic bundle consistently ALPQC Structure Measure #3: Number of hospitals with nonpharmacologic guidelines “in place”			
<p>4. Establish a policy for when to transfer infants to a higher level of care – At facilities offering a lower level of care, nonpharmacologic interventions may be sufficient to reduce separation of mothers from infants. Areas to consider include:</p> <ul style="list-style-type: none"> • establishing a contact person/line with regional referral center • exploring nonpharmacologic care FIRST, prior to transfer • Defining time points and/or criteria necessitating transfer 		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	
		Not applicable	
ALPQC Outcome Measures: % of infants with NOWS \geq 36 weeks receiving pharmacologic therapy & average # of days old when transfer received ALPQC Structure Measure #4: Number of hospitals with policies for transfer of infants “in place”			
<p>5. Need to standardize pharmacologic guidelines in infants with NOWS – Standardization of pharmacologic interventions has been shown to reduce the length of hospital stay in infants with NOWS. Guidelines have been developed for methadone and morphine treatment. Standardization must include:</p> <ul style="list-style-type: none"> • When to initiate therapy • How to wean therapy • When to discontinue therapy • How long infants are observed after therapy <p>Resources: NOWS Toolkit Pharmacologic Management</p>		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	
ALPQC Outcome Measure: Length of pharmacologic treatment ALPQC Outcome Measure: Length of hospital stay ALPQC Structure Measure #5: Number of hospitals with pharmacologic guidelines “in place”			



Neonatal Opioid Withdrawal Syndrome Initiative

Hospital Team Toolkit

<p>6. Ensure safe discharge of infant – Monitoring, education, and support services should continue throughout pregnancy, during hospitalization, and (importantly) following discharge of the infant. Areas of consideration include:</p> <ul style="list-style-type: none"> • Educational topics: safe and secure environment, postpartum depression, NAS signs, nonpharmacologic techniques • Adequate and Appropriate Nutrition • Health Promoting Behaviors • Available Resources <p>Resources: NOWS Toolkit Safe Discharge</p>		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	
<p>ALPQC Process Measure: % of infants \geq 36 weeks discharged with a safe discharge plan ALPQC Process Measure: % of parents receiving education on safe sleep, shaken baby syndrome, postpartum depression, NAS signs, nonpharmacologic techniques ALPQC Structure Measure #6: Number of hospitals with safe discharge plan for infant “in place”</p>			
<p>7. Ensure safe plan for mother – Areas to include:</p> <ul style="list-style-type: none"> • Addiction services • Narcan counseling • Medication-Assisted Treatment (MAT) 		Need to educate on existing policies	
		Need to improve existing policies	
		Need to develop a policy	
<p>ALPQC Process Measure: % of mothers on Medication-Assisted Treatment before discharge ALPQC Process Measure: % of mothers offered addiction services before discharge ALPQC Process Measure: % of mothers given Narcan counseling before discharge ALPQC Structure Measure #7: Number of hospitals with safe discharge plan for mom “in place”</p>			
<p>8. Other helpful information: NOWS Additional Resources</p>			

NOWS Toolkit: Withdrawal Scoring

This information is being provided to help hospitals improve care to babies identified with Neonatal Opioid Withdrawal Syndrome (NOWS), formerly known as Neonatal Abstinence Syndrome (NAS). The information should be helpful in exploring various resources and best practices to develop practices best suited to your hospital and its patients. Nothing herein is meant to be legal advice or advice on a standard of care.

Withdrawal Scoring for NOWS: All infants with in-utero substance exposure should be assessed for signs and symptoms of withdrawal every 3-4 hours beginning within the first 2-6 hours after birth. Scoring should be timed around vital signs, diapering, and feedings.

Key principles of scoring include:

1. The infant should be kept in the room with the mother for scoring, if possible
2. The score encompasses the entire 3-4 hour period, not one point in time
3. The infant should be scored after feeding to ensure hunger is not contributing.

Nationwide, there are two main methods that are being utilized for assessing withdrawal in infants - The Modified Finnegan Scoring System and the Eat, Sleep, Console method. Historically, nurseries and NICUs used the Finnegan system, but recently experts are questioning whether infants are being started on pharmacologic management prematurely and kept on medication for longer than needed.

The Finnegan Scoring Tool lists 21 symptoms that are most frequently observed in substance exposed infants. Each symptom and its associated degree of severity are assigned a score and the total withdrawal score is determined by totaling the score assigned to each symptom over the scoring period. Generally, if an infant scores ≥ 8 three times or ≥ 12 two times, pharmacologic treatment should be considered.

The Eat, Sleep, Console scoring method looks at whether the infant can eat ≥ 1 ounce or breastfeed well, can sleep ≥ 1 hour, and can be consoled within 10 minutes. If these three items are being met, there is no need for pharmacologic management.

Important to note: Whichever scoring tool is being utilized at each facility, proper training of health care professionals is imperative to accurate, consistent, and reliable scores. Neo Advances has materials that can be purchased for training on the Finnegan Scoring system with video demonstrations as well as the capability of doing onsite demonstrations and workshops. More information can be obtained at www.neoadvances.com

Evidence to support this practice:

Finnegan, L. P., Connaughton, J. J., Kron, R. E., & Emich, J. P. (1975). Neonatal abstinence syndrome: assessment and management. *Addictive diseases, 2*(1-2), 141-158.

Grossman, M. R., Lipshaw, M. J., Osborn, R. R., & Berkwitz, A. K. (2018). A novel approach to assessing infants with neonatal abstinence syndrome. *Hospital pediatrics, 8*(1), 1-6.

People to involve in this effort:

Well Baby Nursing / Postpartum Nursing Staff

NICU Nursing Staff

Pediatricians / Neonatologists

Family Practice Physicians

Physical and Occupational Therapists (if available)

Parents

Volunteer "Cuddlers"

Gap analysis & resources:

1. Identify space for rooming-in, as Eat, Sleep, Console is based on keeping the infant with the mother as much as possible
2. Education of nurses/staff regarding scoring tools/methods
3. Assess resources: On-site training workshop, training materials
4. Initiate volunteer cuddler program to help with consoling when parents unavailable

Best practices from other hospitals:

Of the sixteen hospitals that responded to the survey, 11 used the Finnegan Tool; 1 used Eat, Sleep, Console; and 1 used both Finnegan and Eat, Sleep, Console combined.

NOWS Toolkit: Nonpharmacologic Management

This information is being provided to help hospitals improve care to babies identified with Neonatal Opioid Withdrawal Syndrome (NOWS), formerly known as Neonatal Abstinence Syndrome (NAS). The information should be helpful in exploring various resources and best practices to develop practices best suited to your hospital and its patients. Nothing herein is meant to be legal advice or advice on a standard of care.

Nonpharmacological Management for NOWS care: There are a number of ways to soothe babies and support them during withdrawal through means other than medication. This section provides some techniques for nonpharmacological management which hospitals can explore to use with their patients.

- Start nonpharmacologic management on admission or as soon as patient identified
- Rooming-in
 - Limit time away from mom
 - Cluster care – clustering several routine or nursing care events together rather than spacing them out to allow the infant longer periods of rest
 - Limit visitors
- Types of nonpharmacologic management:
 - Encourage skin-to-skin contact and holding by mom
 - Reduction of stimuli including sound, light, and touch
 - Swaddling
 - Swings or mamaroos, as available
 - Infant massage – identify trained providers who can perform and teach parents
 - Non-nutritive sucking, pacifiers
 - Holding and comforting by RNs and volunteer cuddlers
- Child Life and/or OT consults on admission (if available). Another possibility is identifying a NOWS champion who will consult on admission and help ensure that nonpharmacologic care is maximized.
- Feeding
 - Feeding based on hunger cues
 - Smaller, more frequent amounts, if needed
 - Breastfeeding as allowed by protocol (this can be standardized to your hospital; e.g. if maternal UDS negative for non-prescription drugs for 30-90 days prior to admission , good follow-up care, mom in treatment program)
 - Lactose low/sensitive formula, if no breastmilk available
 - Consider fortifying to 22 or 24 cal/oz

- Possible need for NG tube
- Parent education
 - Non-judgmental guidance and teaching by providers and staff
 - Soothing methods
 - Feeding guidance (as above: feeding based on cues; feeding small, more frequent amounts; using lactose low or sensitive formula, if no breastmilk available; being aware of overfeeding propensity)
 - Safe sleep

Evidence to support this practice:

Holmes AV, Atwood EC, Whalen B, et al. Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. *Pediatrics*. 2016;137(6):e20152929

Grossman MR, Berkwitz AK, Osborn RR, et al. An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome. *Pediatrics*. 2017;139(6):e20163360

People to involve in this effort: Non-pharmacological management is most effective when used in a multidisciplinary effort. At a minimum, it is important to involve the patient’s nurses and parents in the care of the baby. Additional benefit can be reaped by involving social workers, occupational therapists, child life therapists, nutritionists, and feeding specialists in certain situations.

Gap analysis & resources:

1. Identify space for rooming-in and/or consider keeping babies with Nows together postpartum on the mother baby floor
2. Education of nurses/staff regarding nonpharmacologic methods
3. Assess resources: swings, mamaroos, low light/sound areas
4. Initiate volunteer cuddler program to help with rocking when parents unavailable
5. Identify availability of therapists/child life specialists

Best practices from other hospitals –

- Rooming-in when able
- “Considering a separate pod for patients with Nows diagnosis to meet their unique needs”
- “Beginning work on a prenatal program that refers patients to outside resources to support them prior to hospitalization”

NOWS Toolkit: Pharmacologic Management

This information is being provided to help hospitals improve care to babies identified with Neonatal Opioid Withdrawal Syndrome (NOWS) formerly known as Neonatal Abstinence Syndrome (NAS). The information should be helpful in exploring various resources and best practices to develop practices best suited to your hospital and its patients. Nothing herein is meant to be legal advice or advice on a standard of care.

Using Pharmacologic Protocols for NOWS

Prior to considering pharmacologic interventions, nonpharmacologic interventions should first be implemented, as these interventions may reduce the need for pharmacologic treatment.^{1,2} These interventions are further described in a different section of this toolkit. If started on pharmacologic therapy, the use of pharmacologic protocols may reduce the length of treatment and hospital stay.³

Choice of Pharmacologic Agent:

There is currently no consensus as to the optimal pharmacologic agent to prescribe for infants with NOWS;⁴ however, morphine is the most commonly used treatment followed by methadone.⁵ Morphine has a shorter half-life and requires more frequent dosing compared to methadone. Additionally, infants receiving methadone may have a shorter length of treatment and hospital stay.⁶

Choice of Weaning Protocol

As no randomized trials comparing different methods of starting, weaning, and discontinuing pharmacologic therapy have been conducted, there is limited data on the optimal dose at which to start, wean, and discontinue therapy, which has resulted in significant practice variation (e.g. the starting dose for methadone ranges from 0.1 mg/kg/day to 0.2 mg/kg/day to 0.4 mg/kg/day). Below are suggested options for weaning of pharmacologic therapy based on pharmacokinetic data and weaning protocols generated by other perinatal collaboratives.^{3,7}

Examples of Weaning Protocols from Other Institutions:

- UAB Methadone Weaning Calculator (Excel) - Listed [HERE](#) for download & use
- [Northern New England PQC \(Yale, Boston Medical, Dartmouth\)](#)
- [Boston University](#)
- [Ohio Perinatal Quality Collaborative](#)

People to involve in this effort

Involvement of a hospital pharmacist and a member of information technology may help facilitate the integration of the following pharmacotherapeutic guidelines into clinical care.

Stages of Pharmacologic Management:

- Initiation:** Prescribe either methadone or morphine if infants score:
 - ≥8 THREE consecutive times
 - ≥12 TWO consecutive times
 - If scores remain elevated, dosage may need to be further increased using protocol
- Weaning:** After initiation, wean medication every 24h as further described below
- Discontinuation and Observation:** Upon stopping therapy, monitor for 48h before discharge

Methodone Weaning Protocol

If after optimizing nonpharmacologic interventions, scores are:

≥ 8 for THREE consecutive scores
OR
 ≥ 12 for TWO consecutive scores

Start methadone at 0.20 mg/kg/day divided every 8h

Are scores on average <8 for following 24h?

Yes

No

- a. Optimize nonpharmacologic interventions
- b. If no improvement, increase dose by 0.20 mg/kg

No

Wean methadone by 10% of maximum dose

Is current dose ≤ 0.04 mg/kg or 20% of max dose?

Yes

1. Discontinue therapy
2. Do scores remain on average <8 for following 48h?

Yes

No

Discharge home

Restart therapy at previous dose and continue therapy until scores <8 for 24h

Morphine Weaning Protocol

If after optimizing nonpharmacologic interventions, scores are:
≥8 for THREE consecutive scores
OR
≥12 for TWO consecutive scores

Start morphine at 0.05 mg/kg/dose every 3h

Are scores on average <8 for following 24h?

Yes

No

a. Optimize nonpharmacologic interventions
b. If no improvement, increase dose by 0.02 mg/kg

No

Wean morphine by 10% of maximum dose

Is current dose ≤0.02 mg/kg or 20% of max dose?

Yes

1. Discontinue therapy
2. Do scores remain on average <8 for following 48h?

Yes

No

Discharge home

Restart therapy at previous dose and continue therapy until scores <8 for 24h

Other Pharmacologic Considerations:

Consider adding phenobarbital as a secondary agent if any of the following:

- 1) on 0.8 mg/kg/day of methadone or 0.3 mg/kg/dose of morphine
- 2) has not weaned by day 7 of treatment
- 3) maternal polypharmacy

Dose: 20 mg/kg loading dose and 5 mg/kg/day maintenance dose weaning by 20% per week

References

1. 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(6).
2. Grossman MR, Lipshaw MJ, Osborn RR, Berkwitt AK. A Novel Approach to Assessing Infants With Neonatal Abstinence Syndrome. *Hosp Pediatr*. 2018;8(1):1-6.
3. Walsh MC, Crowley M, Wexelblatt S, et al. Ohio Perinatal Quality Collaborative Improves Care of Neonatal Narcotic Abstinence Syndrome. *Pediatrics*. 2018;141(4).
4. Patrick SW, Kaplan HC, Passarella M, Davis MM, Lorch SA. Variation in treatment of neonatal abstinence syndrome in US children's hospitals, 2004-2011. *J Perinatol*. 2014;34(11):867-872.
5. Stover MW, Davis JM. Opioids in pregnancy and neonatal abstinence syndrome. *Semin Perinatol*. 2015;39(7):561-565.
6. Davis JM, Shenberger J, Terrin N, et al. Comparison of Safety and Efficacy of Methadone vs Morphine for Treatment of Neonatal Abstinence Syndrome: A Randomized Clinical Trial. *JAMA Pediatr*. 2018;172(8):741-748.
7. Wachman EM, Grossman M, Schiff DM, et al. Quality improvement initiative to improve inpatient outcomes for Neonatal Abstinence Syndrome. *J Perinatol*. 2018;38(8):1114-1122.

NOWS Toolkit: Creating a Safe Plan of Care following Discharge Home

This information is being provided to help hospitals improve care to babies identified with Neonatal Opioid Withdrawal Syndrome (NOWS) formerly known as Neonatal Abstinence Syndrome (NAS). The information should be helpful in exploring various resources and best practices to develop practices best suited to your hospital and its patients. Nothing herein is meant to be legal advice or advice on a standard of care.

Creating a Safe Plan of Care following Discharge Home:

*It is crucial that a safe plan of care for discharge home begins once prenatal screening reveals fetal drug exposure and the possibility of NOWS. Enhanced prenatal services should include NOWS education, as well as preparing mother for role of caregiver. Monitoring, education, and support services should continue throughout pregnancy, during mother and infant hospital stay, and following discharge of infant.

Coordination of federal, state, and local entities ultimately affects how families in need obtain the services necessary to ensure a safe plan of care and achieve optimal outcomes (Chasnoff & Gardner, 2015). Without a structured plan and timeline in place, agencies and stakeholders cannot work in a coordinated effort to achieve agency goals related to treating NOWS and caring for these families (GAO, 2017).

This section provides some techniques hospitals can explore to use with their patients.

The Framework for Childhood Health Promotion (FCHP) outlines a pathway in which public policies and programs can be utilized to promote optimal health outcomes by augmenting the capacities of these families and their communities (Mistry et al., 2012). Using this framework allows policymakers and practitioners the ability to evaluate policies and programs that connect the social, economic, and cultural determinants of health with services that meet the needs of these vulnerable infants and their families (see Figure 1). It is the nurturing and care an infant receives from its parents, other family members, the community, and society that creates a foundation for the development of basic biological and psychosocial functioning (Morris et al., 2004).

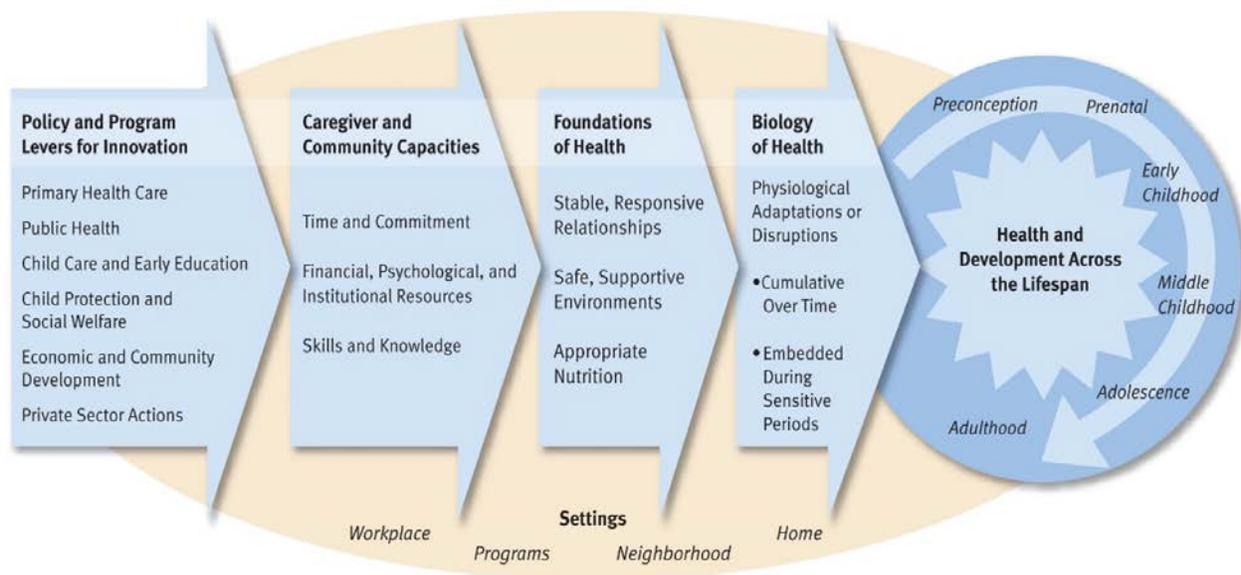


Figure 1. The Harvard Center's Framework for Childhood Health Promotion Reconceptualizing Early Childhood Policies and Programs to Strengthen Lifelong Health. Retrieved from the Center on the Developing Child (2010). *The Foundations of Lifelong Health Are Built in Early Childhood.*

Discharge education specific to the unique needs of infants with NOWS should be provided to caregivers.

In creating a safe plan of care for discharge, all involved stakeholders should ensure that support is offered to caregivers to ensure that four essential foundations of health are met. These include:

1. **Responsive Caregiving**
2. **Safe and Secure Environment**
3. **Adequate and Appropriate Nutrition**
4. **Health Promoting Behaviors**

Responsive Caregiving

- Education in the recognition of infant cues that signal the need for responsive care - hunger, pain, or other stressors
- Importance of breastfeeding, if not contraindicated
- Education and support for caregivers to effectively manage and cope with possible symptoms that persists with NOWS including irritability, feeding intolerances, and growth concerns
- Recognition of early signs that immediate medical attention is needed
- Provide resources for caregiver support and encouragement

Safe and Secure Environment

- Discharge education should include the importance of a safe and secure environment for infant, other children, and caregivers in the household.
 - Specifically include efforts that support optimal neurodevelopment. Interventions include continuing the non-pharmacological treatment interventions that assist in limiting environmental stressors to the infant with NOWS including reduction of noise, low light surroundings, and supporting an enhanced sleep/wake cycle for infants to feel safe and secure in the discharge environment.
- Ensuring that appropriate supervision will be provided, as well as adequate housing and resources necessary for the safety and security of the infant and family.
 - Appropriate housing, electricity, and water
 - Fostering safety for infant, caregivers, and household
 - Removing barriers that may include unsafe adults, illegal activities, and substances in the discharge environment
 - Address further interventions that may avoid abuse, neglect, sudden infant death syndrome, co-sleeping
- Provide resources and contact information for caregiver if safety is compromised

According to Mirick & Steenrod (2016), utilizing risk assessments, evaluation for attachment-based interventions, and opioid dependency treatment may help to promote a safe and secure environment for infants suffering from NOWS. Providing adequate resources and supportive education to families is crucial in ensuring that parents have the tools necessary to properly care for their infants and safeguard their future well-being following discharge home.

Adequate and Appropriate Nutrition

Adequate nutrition in the first years of life is essential for optimal growth and brain development. Infants who exhibit poor postnatal growth due to inadequate nutrition suffer from suboptimal neurodevelopmental outcomes (Martin, Fanaroff, & Walsh, 2015).

- Providing education and support that encourages breastfeeding when appropriate will help to facilitate bonding, reinforce maternal commitment to sobriety, and provide the enormous health benefits associated with breast milk (Wachman et al., 2016).
 - Lactation support following discharge will be beneficial - follow up visits (in home, if available) during first month following discharge, weekly nurse calls to check in, etc.
 - Frequent weight checks for infants with growth issues
- Facilitate nutritional needs for infant, caregiver, and household following discharge.
 - Assisting qualified caregivers in obtaining federal government aid that assists in purchasing and providing optimal nutrition to infants, children, and families.
 - WIC program

Health Promoting Behaviors

A safe plan of care provided to newborns with NOWS incorporates services that seek to establish a strong foundation for health promoting behaviors. Meeting the needs of these families

includes providing appropriate referrals and services that support health promoting behaviors such as treating and managing SUD.

- Providing education for caregiver that includes the importance of preventive healthcare
 - Maintaining scheduled appointments for healthcare promotion and therapies as needed
 - Providing caregiver encouragement to reach out for needed assistance and/or additional resources
 - Education and awareness of long-term effects and outcomes of NOWS and importance of meeting appropriate developmental milestones and early intervention as needed
- Following discharge, ensuring pediatrician is fully aware of infant's history and the need for post-discharge management of NOWS that may include close observation and follow-up. This may include:
 - Frequent weight checks
 - Frequent neurodevelopmental exams to ensure early intervention if needed
- Collaborative efforts between discharging facility and pediatrician should ensure that infants with NOWS are not lost in the transfer of care among healthcare providers and public services.

Evidence to support this practice:

Various studies indicate infants suffering from NOWS are at risk for long-term consequences such as maltreatment, mental health and behavioral issues, and visual disturbances (Uebel et al, 2015). They are often discharged home with mothers receiving inadequate services and support. This further places these infants at risk for failure to thrive, child abuse, and neglect (Association of State and Territorial Health Officials [ASTHO], 2014). Of extreme importance is a direct relationship between adverse childhood events (neglect and abuse) and substance abuse disorder of persons in the home (Maguire et al., 2016). This correlation demonstrates the essential need for changes to state CAPTA plans that will ensure safe environments for these children in the home by providing services and supportive programs to these families. Patrick et al. (2015) notes that infants with NOWS benefit from additional resources provided post-discharge such as case management and follow-up home visitation.

People to involve in this effort:

A safe plan of care for discharge home will require a multidisciplinary approach. This will require healthcare providers including:

- Obstetricians/Gynecologists
- Substance Use Disorder Treatment Providers
- Substance Use Disorder Treatment Counselors
- Neonatologists
- Pediatricians
- Nurse Practitioners
- Occupational Therapists
- Physical Therapists
- Child Life Therapists
- Nutritionists

- Social Workers
- Department of Human Resources

Gap analysis & resources:

1. Specific discharge education for infants with NOWS
2. Collaborative effort with state department officials that utilizes specific discharge follow-up checklist to ensure needs of infant are met following discharge
3. Support services for infant and caregiver following discharge - home health nurse visits for first week following discharge
4. Detailed communication between discharging provider to pediatrician assuming care of infant prior to discharge
5. Ensure pediatric providers are prepared to assume care for high risk infants with NOWS
6. Creating a program between OB/GYN and infant healthcare providers that begins the education and discharge planning process early in pregnancy
7. Increasing NOWS education at substance use disorder clinics

Best practices from other hospitals:

- Neurodevelopmental exams for all infants diagnosed with NOWS prior to discharge
- All infants with NOWS referred for early intervention/neurodevelopmental follow-up exam and assessment
- Provider to provider discharge hand-off with detailed information regarding infant's NOWS history and need for further follow-up or observation.
- Follow-up pediatrician appointment following discharge - within 3 days of discharge



NOWS Protocols Videos/Websites/Training examples

Title: North Carolina Pregnancy & Opioid Exposure Project: <https://ncpoep.org/guidance-document/neonatal-abstinence-syndrome-overview/neonatal-abstinence-syndrome-nas/>

Overview: Toolkit with information and overviews of protocols, policies, and frequently asked questions re: perinatal opioid exposure.

Title: Assessment and Scoring of Infants with NAS <https://www.youtube.com/watch?v=ey4lex-YkcE>

Overview: assessment and scoring of infants with NAS, summary of some important points. Objectives are to discuss whether infants are born addicted to drugs, identify factors that can influence the development of NAS, identify the best screening methods, and describe the importance of accurately scoring infants for NAS.

Title: Maine Quality Counts: Eat, Sleep, Console training vide <https://www.youtube.com/watch?v=BRxmldhx4U0>

Title: Improving Care for Opioid-Exposed Newborns using the Eat, Sleep, Console (ESC) Care Approach <https://www.train.org/main/course/1086916/> (Darthmouth-Hickock)

Other PQC Toolkits/Resources:

- Ohio PQC improves care of Neonatal Narcotic Abstinence Syndrome <https://pediatrics.aappublications.org/content/141/4/e20170900>
<https://opqc.net/projects/NAS>
<https://vimeo.com/107043060> - video of Finnegan Scoring Learning Session
- Kansas PQC Learning Forum <https://kansaspqc.org/nas-learning-forum/>
- Illinois PQC Workgroup <http://www.ilpqc.org/docs/neonatal/NASJuly2017.pdf>

Screening Tool Videos

- North Carolina: Webinar on Finnegan technique differences – Inter-observer reliability <https://www.pqcnc.org/initiatives/resources/13348?page=1>
- NAS Part II – assessment and treatment <https://www.youtube.com/watch?v=W-YxC5HJFXk>
- Treating NAS <https://www.youtube.com/watch?v=Vki59skjn88>
- Assessment and Scoring of Infants w/NAS <https://www.youtube.com/watch?v=ey4lex-YkcE&t=27s>
- Neonatal Scoring Video <https://www.youtube.com/watch?v=eOItH8oKH98>