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Recommendations to the Indian Health Service on Neonatal Opioid Withdrawal Syndrome

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Background

The incidence of neonatal abstinence syndrome has risen dramatically. One study found the national incidence of NAS increased from 3.4 to 5.8 (per 1000 hospital births) between 2009 and 2012. There was geographic variation, with the highest incidence rates in the East South Central Census Division (Kentucky, Tennessee, Mississippi and Alabama) and the lowest in the West South Central Census Division (Oklahoma, Texas, Arkansas, Louisiana).[1] The goal of these recommendations is to provide standards of care to Indian Health Service (IHS) units for the screening, diagnosis and treatment of mothers and infants affected by prenatal opioid exposure including prescription narcotics and illicit opioids with specific consideration given to this unique population. This document includes a description of the syndrome and care considerations for both the mother (the role of early identification of at risk pregnant women and infants, an overview of available treatment modalities to reduce harm from neonatal opioid exposure, and the role of a holistic approach to service linkage) as well as the infant (delivery room and care of at risk infants, monitoring for infant withdrawal, discussion of non-pharmacologic and pharmacologic treatment for infant withdrawal, and considerations for transfer). The goal of IHS Service Units should be to provide supportive, culturally appropriate care. Please note while this document contains some discussion of the care of mothers, the American College of Obstetricians and Gynecologists (ACOG) document, "Recommendations to the IHS on Standards of Care for AI/AN Pregnant Women and Women of Childbearing Age with Opiate Use Disorder" offers more complete information.[2]

While there are other medications and drugs used in pregnancy that can produce neuromotor and autonomic abnormalities in exposed newborns, this document primarily addresses the identification and clinical management of opioid exposure. Infants who are exposed to opioids prenatally may have medical and developmental issues that begin with labor and extend into childhood.[3] The severity and duration of central nervous system abnormalities are not fully known. The terminology Neonatal Opioid Withdrawal Syndrome (NOWS) will be used to describe the clinical condition addressed herein by this document and replaces Neonatal Abstinence Syndrome (NAS) used in previous Indian Health Service (IHS) guidelines.

Early application of non-pharmacologic treatment and support can decrease the need for pharmacologic treatment and transfer. Appendix 2 includes a number of program examples and resources for implementation. Successful implementation of these recommendations should include consideration of additional factors to provide comprehensive care for the prevention and ongoing treatment of opioid-exposed infants, as well as, a discussion of system, policy and fiscal issues that should be considered but are beyond the scope of this document.

How the Recommendations Were Developed

The recommendations contained in this document were developed by a multidisciplinary workgroup convened by the American Academy of Pediatrics (AAP) Committee on Native American Child Health, that included IHS representation. Input from the IHS National Committee on Heroin, Opioids, and Pain Efforts, as well as conversations with tribal leaders contributed to the development of this document. The committee also worked closely with the ACOG, Committee on American Indian/Alaska Native Women's Health, which developed the companion document mentioned above. The development process is described in more detail in Appendix 1.

Where appropriate, this document is based on existing guidance including the following:

- AAP Clinical Report Neonatal Drug Withdrawal.[4]
- Clinical Guidance for Treating Pregnant and Parenting Women With Opioid Use Disorder and Their Infants.[5]
- Opioid Use and Opioid Use Disorder in Pregnancy.[6]

What is Neonatal Opioid Withdrawal Syndrome (NOWS)?

Common opioids (inclusive of compounds that bind to opioid receptors derived from opium and related synthetically produced compounds) that can lead to NOWS include short-acting opioids. These substances include hydromorphone, oxymorphone, hydrocodone, morphine, oxycodone, codeine, fentanyl and heroin. Additionally, long-acting opioids including methadone and buprenorphine can lead to withdrawal. The importance of considering the type of opioid, long versus short-acting, is described later as it relates to onset of withdrawal. NOWS describes a constellation of signs including central nervous system irritability, autonomic instability, and gastrointestinal dysfunction. NOWS occurs in 55-94% of infants exposed to opioids and varies in severity from mild to, in rare cases, life-threatening.[7] Clinical signs of NOWS depend on multiple factors including the type of opioid to which the fetus was exposed, purity of compounds, timing of exposure before delivery, maternal health, and maternal and infant metabolism.

Intrauterine exposure to opioids can cause clinical signs in the pregnant woman and fetus prior to delivery including in utero symptoms that can result in spontaneous abortion, placental injury, and decreased nutrient passage to the fetus. This results in greater risk for intrauterine growth restriction, physiologic instability similar to withdrawal, premature onset of labor, premature rupture of membranes (PROM), stresses during labor with presence of meconium at

delivery, and newborns who are harder to resuscitate immediately following delivery. Understanding the types of drugs used by a pregnant woman, the timing of that use, and the overall health of the woman can lead to anticipation and treatment of problems during labor and delivery that lead to better labor outcomes as well as better long-term outcomes for the infant.

In utero exposure to opioids can have significant effects on newborns after delivery, including withdrawal symptoms, regardless of chronic prenatal exposure, episodic exposure, or specific toxicity of substances. Clinically significant signs of withdrawal are most commonly seen after exposure to opioids, benzodiazepines, and barbiturates. Neurologic dysregulation can also be seen in infants exposed to tobacco, SSRIs, cocaine, amphetamine derivatives, and alcohol. Poly-substance exposure is common throughout the US and can exacerbate signs of withdrawal.[8]

Identification of Pregnant Women at Risk for Opioid Withdrawal

Prevention

Frequent prenatal care visits can create an opportunity for patient engagement in the recovery process, foster a supportive patient-provider relationship, assist with coordination of care, and result in referral to substance use treatment programs. A comprehensive screen for alcohol and other drugs of abuse (AODA) with consideration for placement in a Medication Assisted Treatment (MAT) program is highly recommended for pregnant women diagnosed with an opioid use disorder. See below for additional information regarding the medical management of opioid use disorder.

A pregnant woman should be screened at the initial presentation for care for risk of a substance use disorder as well as for prescription opioid use for the treatment of pain syndromes.

Screening can be conducted by interview to determine past medical history and pregnancy history, self-reported substance use, or toxicology to include maternal urine drug testing and hair testing. Risk factors for NOWS in the maternal history include known history of opioid use or current opioid use disorder or, chronic use of prescription medications for pain control including use not prescribed, unexpected complications of pregnancy known to be associated with drug use including history of unexplained late fetal demise, precipitous labor, placental abruption, preterm labor, PROM, or history of repeated spontaneous abortions. Note: The relationship of substance use with late or no prenatal care may depend on the community's perception of prenatal care being associated with substance use disorder detection and either incarceration or removal of the infant post-delivery. This may be compounded by issues of health care cost and access. Maternal access to MAT may also vary by community. A pregnant woman with reported active or previous substance use history should also be screened for comorbid mental health conditions at the initial prenatal encounter. Detailed recommendations are available in the

Recommendations to the IHS on Standards of Care for AI/AN Pregnant Women and Women of Childbearing Age with Opiate Use Disorder.[2]

Education

Patient education should be a key component of every prenatal care visit.[9] Education should be provided in a non-judgmental, culturally competent way to increase engagement, and in most cases involve the partner or other family members if possible. A pregnant woman with opioid use disorder should receive education on substance use disorders as a chronic medical condition with available treatment that includes the importance of family and peer support and emphasizes that recovery is possible. Additionally, pregnant women with opioid use disorder

should receive education regarding the medical effects (for both herself and her infant) of continued use of both prescription opioids and other illicit substances. Education topics may include health risks caused by using illicit substances, misuse of legal substances, and alcohol exposure, and if relevant, information about benzodiazepines, amphetamines, and tobacco related to increased severity of NOWS symptoms. Education may also include the social and legal consequences of continued use. Linkages to care should be discussed with appropriate referrals to local resources to ensure a collaborative approach to wellness.

Treatment

Medication Assisted Treatment (MAT) combines behavioral therapy and medications to treat individuals who have substance use disorders. MAT is the standard of care as withdrawal from opioid use can endanger the pregnancy and fetus. The rationale for MAT during pregnancy is to prevent complications of illicit opioid use and narcotic withdrawal, encourage prenatal care and drug treatment, and reduce acquisition of possible infections from drug use. [2]

For most women with chronic opioid use and substance use disorders, optimal outcomes for MAT require initiation of concurrent mental health services to treat co-occurring behavioral health disorders and counseling with experienced, culturally appropriate, trauma-informed, empathetic counseling systems. Special consideration to cultural and spiritual healing may lead to better outcomes, including reconnection to language and peers. The FOCUS Program at the University of New Mexico (see Appendix 2) found increased length of pregnancy, lower delivery complications, and higher infant birthweight at delivery for pregnancies of women with prenatal substance use with frequent prenatal care contacts with or without substance use treatment or counseling.[10]

However, with increased numbers of pregnancies affected by opioid use, ongoing care for the woman and infants after delivery requires a coordinated health system approach to increase patient and provider engagement with comprehensive care.[4] Home visitation programs using local, tribal, and IHS resources can be an effective way of providing coordinated care. There are several evidence-based programs that have been developed and implemented in tribal communities such as Family Spirit (see Appendix 2).

Identification of Infants at Risk for NOWS

Infants at risk for withdrawal can be identified by maternal past medical history and pregnancy screening, maternal urine drug testing, infant urine, meconium, and/or umbilical cord drug testing. Screening and evaluation for NOWS can occur while waiting for meconium and/or umbilical cord testing results. It is ideal that screening for substance use both licit and illicit begin early in pregnancy (utilizing screening history approaches with every pregnancy such as the Early Start model.[11] Providers can familiarize themselves with interpretation of toxicology testing that would influence immediate management of labor and delivery.

Depending on the method used for testing, and the dose taken, the urine drug screen detects short-acting opioid use up to about 72 hours after last use, and long-acting opioid use (such as methadone or buprenorphine) up to 5 to 7 days after last dose. In some locations buprenorphine tests must be ordered separate from other urine drug screening panels. There are point of care urine testing systems that identify buprenorphine, methadone, and shorter-acting opioids. The preferred test would show positive results for methadone or buprenorphine if the woman is on medication assisted treatment/maintenance. In general, the mother's history of use provides more complete information than toxicology testing. It is important to consider all these

factors as well as how the results will be used and avoid treating based on a toxicology screen alone. It is important to note that testing is not definitive and can produce false positive or false negative results, including those seen from routine prescribed medications.[12] There are important implications in tribal or state laws regarding positive toxicology obtained from the mother at time of delivery.[13] Testing should be obtained with informed consent given to the mother.

Care of Infants with NOWS

Any infant born to a mother who has been identified as using opioids throughout her pregnancy should be monitored and managed with a formal protocol for NOWS which includes scoring tools such as those listed in Appendix 2. Infants at risk for NOWS should have toxicology testing on meconium, urine, and/or umbilical cord tissue at time of delivery.

Monitoring for NOWS should start at the time of delivery. Signs of NOWS can be categorized as neurologic, gastrointestinal and autonomic (See Table 1). The most significant neurologic signs are decreased quiet-alert state with increase of active crying or deep sleep, which are not easily assessed by semi-objective assessments. Experienced and trained nursing and medical staff, in collaboration with involved parents, can assist with identification and management of NOWS after delivery.

Timing of the onset of signs and symptoms of withdrawal depend on the medication or drug that was used during pregnancy (See Table 2). Opioid withdrawal signs can persist from days to months depending on the half-life of the agent and pharmacokinetics. Infants exposed to short-acting opioids should be observed in the hospital for a minimum of 72 hours, ideally with parents to allow for increased non-pharmacological care and parental education.

Infants exposed to longer-acting opioids, including methadone and buprenorphine, should be

observed for a minimum of 5 days by parents or caregivers. Withdrawal from long-acting opioids can begin up to 2 weeks after delivery, thus parents should be educated about signs of NOWS that may require medical care after discharge from the hospital or birthing center.

Table 1. Withdrawal Signs

Neurologic	Gastrointestinal	Autonomic
High pitched cry	Vomiting	Diaphoresis
Irritability	Diarrhea	Nasal congestion
Sneezing	Dehydration	Temperature instability
Tremor	Poor weight gain	Hyperthermia
Hyperreflexia	Poor feeding	Increased respiratory rate
Frequent Yawning	Uncoordinated suck and swallow	Increased blood pressure
Seizures		Sweating

Modified from Hudak ML, Tan RC. Neonatal drug withdrawal. *Pediatrics.* 2012;129(s):e540-60

Table 2. Estimated Onset of Signs of Withdrawal

Drug	Approximate time to onset of withdrawal signs following birth
Barbiturates	Range from 1-14 days
Cocaine	Usually none, decreased arousal and physiologic stress can occur at 48-60 hours of life and can last for months
Alcohol	3-12 hours
Heroin	Within 24 hours
Marijuana	Usually none
Methadone	3-7 days, severity is not correlated to maternal dosage
Methamphetamines	Usually none. Decreased arousal, increased physiologic stress, feeding dysregulation, and poor quality of movement can occur 48-60 hours of life and can last for months
Opioids other than Methadone and Buprenorphine	1-3 days
Methadone and Buprenorphine	2-6 days
Sedatives	1-3 days
Synthetic Opioids	Unknown

Modified from Hudak ML, Tan RC. Neonatal drug withdrawal. Pediatrics. 2012;129(s):e540-60

Delivery Room Considerations

Efforts should be made by the delivering physician to adequately address maternal pain control during labor and delivery. Naloxone is contraindicated in the delivery room for infants

exposed to opioids prenatally as naloxone may precipitate severe withdrawal in the infant.

Signs suggestive of NOWS in the infant shortly after delivery can also identify infants at risk for withdrawal. The risk of an infant developing NOWS may be lower if the mother has not used opioids for 14 days prior to the birth[4], although NOWS can still occur even when opioids are used in the first trimester without history of ongoing use in second and third trimesters.

Care of Infants Exhibiting Signs of NOWS

Factors that influence how to manage an infant exhibiting signs of NOWS should include the clinical status of the infant, and an interview with the mother about substance use during pregnancy. The management of an infant exhibiting NOWS should be informed by, but not limited, to the toxicology screening of the mother to assess for substance use as well as toxicology testing on meconium, urine, and or umbilical tissue.

Infants exhibiting mild signs of NOWS should be managed with non-pharmacological interventions in a formal protocol and monitored for development of more severe symptoms, while infants displaying moderate to severe signs of NOWS should be managed with non-pharmacologic interventions as well as pharmacological interventions when needed, both in formal protocols.[14]

Infants exhibiting signs of NOWS who cannot maintain adequate hydration, experience weight loss, demonstrate neurologic changes, or experience temperature instability despite optimal management, should have additional medical evaluations to rule out other potential conditions, and transfer to neonatal intensive care unit may be considered. Clinical signs and symptoms of NOWS that interfere with the infant's ability to regulate physiologically to attain normal quiet-alert state, to have adequate feedings for growth, and risks of dehydration for

persistent vomiting or diarrhea may be an indication for pharmacologic therapy. It is very important to have a consistent approach to scoring when using any of the scoring tools (Appendix 2) to determine if pharmacologic therapy is appropriate, and to do so only after non-pharmacologic intervention has been adequately implemented.

Non-pharmacological Interventions

Non-pharmacologic treatment is the preferred management for NOWS, is appropriate for all infants at risk for NOWS, and can begin at birth. The goal of non-pharmacologic interventions, or supportive care, is to create a calm, quiet, and controlled environment where there is appropriate stimulation for the newborn to restore greater periods of quiet-alert state.[15] Birthing centers may also consider other members of the health care team and additional support staff for help in providing newborn care.

Non-pharmacologic methods include:

- Rooming in
- Close mother /infant contact
- Skin-to-skin care
- Swaddling to reduce excessive neuromotor dysregulation
- Minimal sensory or environmental stimulation and appropriately timed stimulation
- Responsive infant cue reading by hospital staff, parents, and family
- Rocking by parents or providers with attention to infant cues
- Using a pacifier for non-nutritive sucking
- Breastfeeding when appropriate
- Attention to quantity and number of feedings to avoid over feeding

- Grouping care and vital sign measurements to minimize interruptions

Pharmacological Interventions

Currently, there is no universally recommended dosing or weaning regimen for treating NOWS.[4]

Pharmacologic interventions include liquid oral morphine and liquid oral methadone. Oral liquid clonidine, or oral liquid phenobarbital can be used as adjuvants for infants with severe NAS not adequately relieved by morphine or methadone. Refer to Appendix 2 to facilitate implementation of site-specific protocols.

Weaning according to a consistent protocol results in fewer days of opioid treatment and shorter length of stay. [16] Considerations should be made on a facility level and should ideally be consistent. More information can be found in the American Academy of Pediatrics and American College of Obstetrics and Gynecology Guidelines for Perinatal Care (2017).[17]

Breastfeeding

Recommendations for women interested in breastfeeding are based largely on expert opinion because of the sparse research base on these issues.[16,18-20] The following documents should be used for specific recommendations. The Academy of Breastfeeding Medicine Protocol Committee. ABM Clinical Protocol #21: Guidelines for Breastfeeding and Substance Use or Substance Use Disorder, Revised 2015[21] and Substance Abuse and Mental Health Services Administration. Clinical Guidance for Treating Pregnant and Parenting Women With Opioid Use Disorder and Their Infants.[5]

Women interested in breastfeeding should be counseled regarding the risks and benefits for their infant, including perceived risks in relation to substance use.

Environmental Considerations During NOWS Treatment

Anticipatory care of infants at risk of NOWS starts with planning for the physical environment of inpatient units. Ideally, mothers and infants with risks for NOWS will have hospital rooms that increase opportunities for skin-to-skin contact, support frequent breastfeeding, are culturally supportive, and reduce environmental sound and light. Birthing centers may find it helpful to review current technology and options to optimize patient care such as monitoring systems that place sensors on infants with remote monitoring for pulse rate, respiratory rate, and oxygen saturation may facilitate implementation in hospital settings. Other considerations include developing nursing and unit procedures that reduce disturbance of skin-to-skin contact and sleep cycles. Training on providing trauma-informed care and awareness of cultural and tribal approaches for all staff, in addition to ongoing review of policies and procedures impacting care, improves the quality of care for mothers and substance-exposed infants during hospitalization. Unit leadership should demonstrate these skills through empathetic awareness of the effects of life-trauma on newly delivered mothers. This creates inpatient environments that support the best outcomes for care of mothers and infants and serves as a model for all employees working in a unit.

Supportive care of infants with risks of NOWS includes observing the normal course of increased symptoms and decreasing symptoms over time. Considering fixed sequela of drug exposure on the infant is important to review. Supportive care practices, increased skin-to-skin contact, parent presence with infant, and increased breastfeeding may reduce infant

dysregulation and the need for pharmacological treatment for NOWS. Rooming-in practices have shown reductions in infants requiring opioid replacement therapy and shorter duration of hospitalizations.[22]

Pharmacological treatment is started dependent on a safe staffing ratio, mother-baby needs, and the facility's capabilities. The American Academy of Pediatrics and American College of Obstetrics and Gynecology Guidelines for Perinatal Care suggest a minimum staffing of one registered nurse for every two to three patients in intermediate care and one nurse for every one to two patients in intensive neonatal care. [23] Cardio-respiratory monitoring is required for all infants started on morphine. Monitoring should be continued for 4 days and/or until the dose is reduced. Cardio-pulmonary monitoring may be done from a central station similar to current technology for remote monitoring of labor and delivery rooms for women admitted for labor.

Cross training for other nursing staff is a consideration and can make unpredictable situations less stressful. Units may also consider telemedicine and remote assistance routes to help augment staffing. Further monitoring can be done at the discretion of the team.

If infants reach the threshold for pharmacological treatment (as determined by clinical screening, provider and nursing comfort, and monitors), and treatment cannot be started due to unsafe staffing ratios, then infants should be transferred to a hospital that can provide them with the pharmacological treatment required.

The considerations for transfer of an infant to another facility include:

- Infants with prematurity considered under 37 weeks as defined by ACOG (threshold based on best gestational age assessment) and NOWS
- If infants reach the threshold for pharmacologic treatment (as determined by clinical

screening, provider and nursing comfort, and monitors), and treatment cannot be started due to unsafe staffing ratios, then infants should be transferred to a hospital that can provide them with the pharmacologic treatment required.

Considerations about which hospitals to transfer an infant to include:

- Resources for mothers: rooming in, hospital culture, breastfeeding support
- Access to MAT for mothers
- Culturally sensitive and supportive care
- Ability to return to community for future care
- Geographic isolation for tribal connection and community

Discharge Planning and Coordination

When planning for the discharge of infants at risk of or treated for NOWS, it is important to consider many factors. Facilitating rooming-in, whenever feasible, for mothers whose infants stay in the hospital for observation or treatment of NOWS represents best practices for mothers and infants. Planning and coordination of care should strive to model best infant care for the family including environmental modifications around the infant, education about infant states, support of breastfeeding or appropriate formula feeding, appropriate sleeping arrangements, activities to support infant development, continuation of maternal substance use disorder care and counseling, and preparation of the infant's home environment for safety considerations such as use of car seats, smoke detectors, and carbon monoxide detectors.[24]

Many infants who are at risk of or treated for NOWS are also at risk for potential late onset withdrawal symptoms, which can occur up to 2 weeks after discharge. Families should receive education at discharge about signs and symptoms of seizures, feeding problems, excessive crying, and diarrhea and vomiting that accompany withdrawal. Families should receive

contact information for the discharging hospital or primary care providers with experience in assessing late withdrawal for questions or concerns or if they suspect their infant may be experiencing withdrawal.

It is important to provide information regarding safe infant sleep. Staff discharging infants can provide education to parents while reinforcing safe sleeping practices initiated in the hospital. Co-sleeping in the parents' bed should be discouraged while providing education and support for continued breastfeeding. It can be helpful to develop and partner with programs to provide families with a safe sleep environment, including cultural considerations.[25]

Mothers of infants discharged after observation for NOWS should have access to continuing outpatient lactation support to establish and/or maintain successful lactation particularly if the mother has pumped and stored colostrum or expressed breastmilk due to possible transmission of drugs in breastmilk. The mother can receive counseling about feeding the infant at breast and not using the pumped milk if there is risk of contaminants in the stored colostrum or milk. Discharging staff may also educate parents about appropriate feeding techniques including formula volumes.

Staff involved in the discharge of infants observed or treated for NOWS should develop communication strategies for transmission of medical information to outpatient providers identified by the parents. The long-term goal of planning for discharge is a well-bonded mother and infant with optimization of successful development of mother and child after birth.

Care After Discharge From Hospital

Providers coordinating care of mothers and infants can partner with the family to identify outpatient providers and systems of care to optimize the health, cognitive and psychological

development of mothers and infants creating an ideal medical home. This system of care might require providers to identify community and tribal agencies working with families to address social determinants of health that may affect mothers and families including factors such as food insecurity, homelessness, poverty, and domestic violence. Identifying potential agencies for collaboration will lead to the organization of a local system of care that may include residential care for parenting women with substance use disorders, early childhood programs such as public health nurses, infant nutrition and lactation support programs such as WIC, early childhood home visiting services utilizing evidence-based or promising practice strategies, early intervention programs funded through Part C of the Individuals with Disabilities Act, tribal and state agencies, Early Head Start and Head Start, and school systems, housing, transportation and subsidized child care. Providers can partner with community and tribal programs to organize support and optimize development for infants with prenatal drug exposure.

The individual development of mothers and infants affected by prenatal substance use can be greatly improved by supporting the mothers in their recovery progress, support of the mothers' primary care and reproductive health needs, ongoing lactation support, primary well-child care of young children, and enhanced developmental care of young children. As many AI/AN women with substance use disorders accessing care have experienced multiple life traumas including adverse childhood experiences (ACES), developmental care of the mother should be organized around empathy for surviving past trauma and understanding the potential impact of trauma on parenting ideas and practices.[26] Access to ongoing mental and behavioral health is important. A discussion surrounding the full range of FDA-approved contraceptive options (including options for placement of long-acting reversible contraceptives) and how to access birth control and reproductive care should begin prior to discharge. This is discussed in

more detail in the ACOG document, "Recommendations to the IHS on Standards of Care for AI/AN Pregnant Women and Women of Childbearing Age with Opiate Use Disorder". This care can be provided in partnership with tribal entities whenever available.

It is especially important to follow recommendations for developmental surveillance and screening with heightened awareness by providers of care to young infants for early problems of emotional behavioral regulation, the "fussy baby." Surveillance should happen at every well-child preventive care visit. Any concerns should be addressed promptly with standardized developmental screening tests. In addition, screening tests should be administered regularly at the 9-, 18-, and 24 or 30-month visits.[27] If developmental screening suggests delays in acquisition of expressive language milestones or emotional behavioral delays, either referrals to early intervention should be made promptly or a follow up visit to the provider should be scheduled for repeat screening no more than 3 months later.

Conclusion

Implementation of programs to foster early universal screening, brief intervention, and referral to treatment of pregnant women with opioid use disorder can improve maternal and infant outcomes. An evaluation of locally available resources and engagement with tribal programs to create culturally sensitive, holistic approaches to increase access to prenatal care and expand early identification and treatment of pregnant women at risk for opioid use disorders can improve outcomes. Creation of policies and procedures at IHS Labor and Delivery hospitals can assist with early infant assessment to detect risk of NOWS as well as facilitate early diagnosis and management of opioid exposed infants. Preserving the infant-mother dyad is of the utmost importance, and every effort to keep infants in their families and/or communities will prevent

further trauma and dislocation from cultural belonging. This is facilitated by non-pharmacologic approaches to trauma informed care of infants born to mothers with substance use disorder. Finally, ongoing coordinated care for both the infant and mother following discharge is necessary to optimize long-term outcomes.

Appendix 1: Development Process

The recommendations in this document were developed by a multidisciplinary workgroup convened by the American Academy of Pediatrics (AAP) Committee on Native American Child Health (CONACH) with support from the U.S. Indian Health Service (IHS). The workgroup was comprised of representatives from the AAP, IHS, and American College of Obstetricians and Gynecologists. Workgroup members had expertise in general pediatrics, neonatology, nurse management, pharmacology, trauma-informed care, breastfeeding, health care policy and administration.

The workgroup met in July 2017 to review current treatment recommendations and research developments for NOWS, identify best practices for delivery room management, explore criteria for transferring to a regional neonatal intensive care unit, and discuss strategies for testing, treatment, and follow-up care. This work served as the basis for development of this document. Where possible, the recommendations are based on existing guidance but are specific to American Indian/Alaska Native mothers and newborns and address specific needs in this population. Input was sought from tribal and other stakeholders.

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Shaquita Bell, MD, FAAP
Andrew Hsi, MD, MPH, FAAP
Mark Hudak, MD, FAAP
Lilly Lou, MD, FAAP
CDR Tyler Lannoye, PharmD
Dorothy A. Dupree, MBA
Kathleen Hastings, BS, RN, IBCLC
Stephen Patrick, MD, MPH, MS, FAAP
Angela S. Kueck MD, FACOG, FACS
Steve Holve, MD, FAAP
Jean Howe, MD
The Indian Health Service National Committee on Heroin, Opioids, and Pain Efforts

Appendix 2: Resources for Implementation

Scoring Tools

Several scoring tools exist. Tool choice may vary depending on the needs of the site, community, and patient. Scoring should begin between 2 and 4 hours of life and continue every 4 hours for the duration of the observation period. Parents can be educated about the scoring tool being used and may be invited to participate in scoring to the greatest extent possible. It is very important to have a consistent approach to this scoring and to do so after the infant has been comforted in other cares (changing, feeding, swaddling, etc.). The most commonly used scoring tool is the Modified Finnegan Scoring Tool and the Lipsitz Neonatal Abstinence Syndrome Scoring System (modified); however, other tools include:

- **Finnegan scoring tool**: Finnegan LP. Neonatal abstinence. In: Nelson NM, ed. Current Therapy in Neonatal–Perinatal Medicine. 2nd ed. Toronto, Ontario: BC Decker Inc; 1990.
- **Lipsitz Neonatal Drug-Withdrawal Tool**: Lipsitz PJ. A proposed narcotic withdrawal score for use with newborn infants: A pragmatic evaluation of its efficacy. Clin Pediatr. 1975;14:592–594
- **Eat Sleep Console Approach:** There is limited experience with this management protocol that forgoes quantitative scoring of signs but instead evaluates the functional abilities of a baby. The ESC protocol reviews whether an infant can eat sufficiently, sleep at last one hour, and be consolable in a reasonable amount of time. The Yale group that reported significant reductions in length of hospital stay and need for pharmacotherapy achieved this success over a period of years during which time it marshalled significant resources to implement multiple sequential changes in protocol and institutional culture. (Grossman MR, Lipshaw MJ, Osborn RR, Berkwitt AK. A novel approach to assessing infants with neonatal

abstinence syndrome. *Hospital Pediatrics*. 2017;7 http://hosppeds.aappublications.org/content/early/2017/12/18/hpeds.2017-0128.info)

- **Withdrawal Assessment Tool** - Version 1 (WAT-1): Franck LS, Harris SK, Soetenga DJ, Amling JK, Curley MAQ. The Withdrawal Assessment Tool - Version 1 (WAT-1): an assessment instrument for monitoring opioid and benzodiazepine withdrawal symptoms in pediatric patients. Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies. 2008;9(6):573-580. doi:10.1097/PCC.0b013e31818c8328.

Program Resources

For more information about the programs described in the guidance visit the following web sites:

- Early Start Perinatal Substance Abuse Program – Kaiser Permanente Northern California: https://earlystart.kaiserpermanente.org/
- FOCUS Program http://cdd.unm.edu/echfs/Focus.html
- Family Spirit (http://caih.jhu.edu/programs/family-spirit) and (https://homvee.acf.hhs.gov/Model/1/Family-Spirit-sup---sup-/60/1)
- CenteringPregnancy® (Centering® Healthcare Institute): https://www.centeringhealthcare.org/what-we-do/centering-pregnancy

References

1. Patrick SW, Davis MM, Lehmann CU, Cooper WO. Increasing incidence and geographic distribution of neonatal abstinence syndrome: United States 2009-2012. *Journal of Perinatology*.2015;(35)8: 650–655
2. American College of Obstetricians and Gynecologists, Recommendations to the IHS on standards of care for AI/AN pregnant women and women of childbearing age with opiate use disorder. 2019. Available at: https://www.ihs.gov/sites/opioids/themes/responsive2017/display_objects/documents/acogguidelines2018.pdf. Accessed May 9, 2019
3. Messinger DS, Bauer CR, Das A, et.al.The maternal lifestyle study: Cognitive, motor, and behavioral outcomes of cocaine-exposed and opiate-exposed infants through three years of age. *Pediatrics*. 2004;113(6): 1677-1685
4. Hudak ML, Tan RC, Committee on Drugs, Committee on Fetus and Newborn. Neonatal drug withdrawal. *Pediatrics*. 2012;129(2):e540-560
5. Substance Abuse and Mental Health Services Administration. Clinical Guidance for Treating Pregnant and Parenting Women With Opioid Use Disorder and Their Infants. HHS Publication No. (SMA) 18-5054. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2018
6. Opioid use and opioid use disorder in pregnancy. Committee Opinion No. 711. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2017;130:e81–94.
7. Hund RW, Tzioumi D, Collins E, Jeffery HE. Adverse neurodevelopmental outcomes of infants exposed to opiate in-utero. *Early Hum Dev*. 2008; 84(1):29-35
8. Kocherlakota P. Neonatal abstinence syndrome. *Pediatrics.* 2014;134(2):e547-e561

9. Council on Patient Safety in Women's Healthcare. Obstetric Care for Women with Opioid Use Disorder. Available at: http://safehealthcareforeverywoman.org/patient-safety-bundles/obstetric-care-for-women-with-opioid-use-disorder/ Accessed May 9, 2019
10. Hsi A. Care of pregnant and parenting women and their children affected by substance use disorders: designing a care system around the family medical home. December 11, 2014. Available at https://www.ihs.gov/sites/telebehavioral/themes/responsive2017/display_objects/documents/slides/clinicalrounds/womensacare1214.pdf Accessed May 9, 2019.
11. Taillac C, Goler N, Armstrong MA, Haley K, Oseio V. Early start: an integrated model of substance abuse intervention for pregnant women. *Perm J*. 2007 Summer; 11(3): 5–11. PMID: 21461106
12. Levy S, Siqueira LM, Committee on Substance Abuse, Testing for drugs of abuse in children and adolescents. *Pediatrics*. 2014;133(6): e1798-e1807
13. Guttmacher Institute. Substance Use During Pregnancy. 2019.Available at: https://www.guttmacher.org/state-policy/explore/substance-use-during-pregnancy Accessed May 9, 2019
14. Ostera EM. Infants of drug-dependent mothers. In Berg FD, Ingelfinger JR, Wald ER, eds. Current Pediatric Therapy. Vol 14. Philadelphia: WB Saunders; 1993
15. Sanlorenzo LA, Stark AR, Patrick SW. Neonatal abstinence syndrome: an update. *Curr Opin Pediatr*. 2018;30(2):182-186
16. Hall ES, Wexelblatt SL, Crowley M, et al. A Multicenter cohort study of treatments and hospital outcomes in neonatal abstinence syndrome. *Pediatrics*. 2014;134(2): e527-e534

17. American Academy of Pediatrics, American College of Obstetricians and Gynecologists. Guidelines for perinatal care. 8th ed. Elk Grove Village (IL): AAP; Washington, DC: American College of Obstetricians and Gynecologists; 2017
18. Short VL; Gannon M; Abatemarco DJ. The association between breastfeeding and length of hospital stay among infants diagnosed with neonatal abstinence syndrome: a population-based study of in-hospital births. *Breastfeeding Medicine*: 2016;11:343-9.
19. Abdel-Latif ME, Piner J, Clews S, et al. Effects of breast milk on the severity and outcomes of neonatal abstinence syndrome among infants of drug dependent mothers. *Pediatrics* 2006; 117;e1163
20. Newman A, Davies GA, Dow K, et. Al. Rooming-in care for infants of opioid-dependent mothers: Implementation and evaluation at a tertiary care hospital. *Can Fam Physician*. 2015;61(12):e555-61
21. The Academy of Breastfeeding Medicine Protocol Committee. ABM Clinical Protocol #21: Guidelines for Breastfeeding and Substance Use or Substance Use Disorder, Revised 2015. *Breastfeeding Medicine.* 2015; 10(3):135-141
22. Grossman MR, Lipshaw MJ, Osborn RR, Berkwitt AK. A novel approach to assessing infants with neonatal abstinence syndrome. *Hospital Pediatrics*. 2018;8(1):1-6
23. American Academy of Pediatrics, American College of Obstetricians and Gynecologists. Guidelines for perinatal care. 8th ed. Elk Grove Village (IL): AAP; Washington, DC: American College of Obstetricians and Gynecologists; 2017; page 51
24. Hagan JF, Shaw JS, Duncan PM, eds. Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, 4th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2017

25. Moon RY, Task Force on Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: evidence base for 2016 updated recommendations for a safe infant sleeping environment. *Pediatrics.* 2016;138(5)
26. Dub SR, Felitti VJ, Dong M, Chapman DP, Giles WH, Anda RF. Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study. *Pediatrics*. 2003;111(3)
27. Council on Children With Disabilities, Section on Developmental Behavioral Pediatrics, Bright Futures Steering Committee, Medical Home Initiatives for Children With Special Needs Project Advisory Committee. Identifying infants and young children with developmental disorders in the medical home: an algorithm for developmental surveillance and screening. *Pediatrics*. 2006;118(1)