DOI: 10.1097/JPN.0000000000000108

CE **Continuing Education**

J Perinat Neonat Nurs • Volume 29 Number 4, 277–286 •

Lactation and the Substance-Exposed Mother-Infant Dyad

Lauren M. Jansson, MD; Martha Velez, MD

ABSTRACT

Pregnant and postpartum women with substance use disorders have very unique needs and can present challenges to healthcare providers who are not familiar with how to evaluate and respond properly to their necessities. One such situation frequently arises when women with substance use disorders wish to breast-feed. There are many benefits and challenges to this practice that are specific to this population, and treating practitioners are often unclear on how to address them. The purpose of this article is to identify barriers to lactation in substance-exposed dyads and to provide strategies to mitigate these barriers and for promoting lactation in appropriate women with substance use disorders who wish to breast-feed.

Key Words: breast-feeding, breast milk, lactation, maternal drug dependency, substance-exposed infants, substance use disorder

The growing problem of peripartum substance use/misuse and its attendant effects on the mother, infant, mother-infant dyad, healthcare providers, and the healthcare system in the United States today has reached epidemic proportions. Among pregnant women of childbearing age, 5.4% were illicit drug users in 2012-2013.[1] Opioid dependency is a particular concern as numbers and costs associated with neonatal abstinence syndrome (NAS) due to maternal opioid use have tripled in the last decade.[2] Gestational marijuana use is a concern, with as many as 11% to 20% of pregnant women reporting recent use.[3,4] Cannabis potency has increased 4-fold in the last 30 years.[5] Strategies for improving care in this arena are optimally multipronged and include improved identification, education, prevention, and treatment efforts for women of childbearing age and improved identification and treatment of the substance-exposed infant with NAS. Breast-feeding, when it is appropriate, is one strategy that may mitigate the expression of NAS and other neurobehavioral alterations related to in utero substance exposure in affected infants. The purpose of this article is to identify barriers to lactation in substance-exposed dyads, to provide strategies in mitigating these barriers, and for promoting lactation in appropriate women with substance use disorders who wish to breast-feed.

It is well accepted that breast-feeding provides myriad short-, medium-, and long-term medical and cognitive benefits for children and medical and emotional advantages for mothers.[6] The substance-exposed dyad in particular is likely to benefit from lactation and breast milk when the mother is an appropriate candidate for lactation. However, there are barriers that can prevent lactation in this population.

BARRIERS TO BREAST-FEEDING IN THE SUBSTANCE-EXPOSED DYAD

Barriers to the initiation of lactation in this group are likely to also influence continued lactation. These barriers are likely due to (1) the mother with a substance use disorder, (2) the infant with NAS or other neurobehavioral alterations due to exposures to licit

Author Affiliations: Department of Pediatrics, Johns Hopkins University School of Medicine, Baltimore, Maryland (Dr Jansson); and Johns Hopkins Bayview Medical Center, Baltimore, Maryland (Dr Velez).

Disclosure: The authors have disclosed that they have no significant relationships with, or financial interest in, any commercial companies pertaining to this article.

Corresponding Author: Lauren M. Jansson, MD, Department of Pediatrics, Johns Hopkins University School of Medicine, 4940 Eastern Ave, D4, Baltimore, MD 21224 (ljansson@jhmi.edu).

Submitted for publication: January 12, 2015; accepted for publication: March 17, 2015.

and illicit substances, and (3) the provider and the environment.

The mother with a substance use disorder

A smooth process of breast-feeding requires a calm and confident mother who is able to understand both internal mental and physical cues and infant cues. Deficits in maternal self-awareness and self-regulatory abilities among women with substance use disorders that may impact the lactation process can be created by acute and/or chronic use of drugs, psychiatric comorbidity, trauma history, or a combination thereof.

Maternal factors related to addiction

Continued active gestational drug use or postpartum relapse to substance use are not uncommon[7] and must be considered in all women with substance use disorders who wish to breast-feed. The choice of breast-feeding alone does not indicate a sufficiently healthy lifestyle for the endorsement of lactation in all women with substance use disorders.[8] Women actively using drugs can have substances of abuse/misuse and their metabolites, plus adulterants (ie, added chemicals or contaminants) found in some substances of abuse, in breast milk. Some of these components can lead to infant intoxication and death, as noted in Table 1.

The breast-fed infant, as compared with a formula-fed infant, must necessarily be physically approximated with the mother more often and more frequently needs attention due a shorter feeding schedule. Therefore, the breast-fed infant may be at greater risk by a mother who is actively drug taking/seeking, living in a chaotic environment, exposed to/engaged in violence, or involved in crime or prostitution. Altered maternal responses due to psychoactive substances can lead to physical harm for the infant due to maternal somnolence during breast-feeding, poor positioning on the breast, poor judgment, and/or risk minimization. Women with substance use disorders on medication-assisted treatment (MAT) with methadone or buprenorphine frequently need downward adjustments in medication in the immediate postpartum period and may have interim transient somnolence. It is not always easy to determine the reason for increased sedation/tiredness in recently postpartum women with substance use disorders. Sedation may be due to active use, the need for a decrease in MAT dosing, depression, sleep disorders secondary to a history of sexual abuse,[9] or fatigue due to the care of a demanding newborn. All, and any

Table 1. **Substance of abuse: Breast milk concentrations and known infant effects**

Substance	Concentration in breast milk	Infant symptoms	Infant intoxication/ death reported	Other
Cocaine	Variable; high concentrations possible[44]		Infant intoxication reported[45]	
Amphetamines	M/P = 2.8-7.5[46]	Irritability agitation[47]	Infant death reported[48]	
PCP	High concentrations (single case report)[49]			
Benzodiazepines		Lethargy, poor weight gain, apnea[50]	Infant death reported[51]	Drug-drug interactions possible Used alone, may present minimal risk[52]
Alcohol		Altered sleep wake cycles[53] Delayed infant development[54]		Alters infant milk intake[55]
Opioids	Morphine: M/P = 2.45	CNS depression[56]	Codeine: 1 infant death (mother an ultrarapid Cy2D6 metabolizer)[57] Methadone: 1 infant (maternal misuse in a methadone-naive pair)[58]	

Abbreviations: CNS, central nervous system; PCP, phencyclidine; M/P, milk to maternal plasma ratio.

combination of the aforementioned factors, must be considered.

Neurochemical changes in the maternal brain related to the chronic use of drugs and drug seeking may result in poor interoception (the ability to read one's own internal cues), poor attention and emotional regulation,[10] increased impulsivity and risk taking, which can particularly affect the breast-feeding process. Breast-fed infants require more frequent feedings and therefore exhibit more frequent cues that require an attentive, self-regulated mother who is able to accurately interpret the infant's cues and to respond in a contingent, sensitive way. For some women with substance use disorders, parenting and infant cueing, normally perceived as rewarding, are instead replaced by a stressful neurophysiological response that can portend maternal relapse.[11] Women with substance use disorders may have difficulty interpreting any infant cue due to lack of parenting skills, poor internal representation of the infant, and unrealistic developmental ideals.

Substance-dependent people in general have low tolerance for pain/discomfort or setbacks, making breast-feeding a source of concern or fear (ie, breast-feeding will hurt, the infant will reject my breast and me) and therefore risky. Maternal misconceptions regarding the safety of MAT, hepatitis C infection, smoking, and breast-feeding may derail the decision to breast-feed in some mothers. While many providers consider these factors compatible with breast-feeding, many remain cautious, particularly when more than 1 of them coexists in the same woman.

Factors related to psychiatric comorbidity

Between one-half and two-thirds of women with substance use disorders have 1 or more psychiatric comorbidities.[7,12–14] Anxiety and depression have been related to poor initiation and early cessation of breast-feeding.[15,16] Psychiatric conditions and required medications can further affect the choice to breast-feed. While most medications that are prescribed for psychiatric concerns are compatible with breast-feeding, safety has not been established for all.[17] Mothers who require these medications may view them as potentially harmful for the infant, particularly if they are taking other medications such as methadone or buprenorphine. Mothers with psychiatric conditions may stop taking medications during lactation, putting them at risk for increased symptoms that can affect not only the lactation process but also maternal functioning and dyadic interaction.

Often women with substance use disorders feel guilt and anxiety after delivery, particularly if the infant displays NAS or symptoms of neurobehavioral dysregulation related to exposures, which can compound existing or postpartum depression or anxiety disorders. Anxiety is frequently heightened by interventions by child protective services interventions, familial difficulties, and the demands of substance abuse treatment facilities. Many women with substance use disorders struggle with emotional modulation and the appropriate expression of unpleasant feelings. This can lead to mistrustful relationships with the medical staff and/or disruptive behavior when feelings of being misunderstood or stigmatized by the medical care staff arise.

Factors related to trauma exposure

Women with substance use disorders are at elevated risk for trauma exposure Violence against women with substance use disorders is so frequent that most perinatal healthcare providers will encounter concerns or behaviors among pregnant women related to current or past abuse during the lactation process. In a study of 715 pregnant women in substance abuse treatment, 41% and 73% reported a history of sexual and physical abuse, respectively, and 7% and 20% of those reporting sexual and physical abuse during the current pregnancy.[18] Women who have experienced sexual violence are as likely or more likely to initiate breast-feeding as the general population[19,20] but may be more likely to stop breast-feeding early.[9] Many women become aware of abuse or its emotional cost during pregnancy, during delivery, or in postpartum period, as many sensations associated with childbirth and breast-feeding may be emotion-provoking or produce symptoms of reexperiencing the trauma. Some situations that produce flashbacks, intrusive thoughts, feelings of powerlessness or panic attacks include being confined to a bed/tethering via monitors/intravenous lines, examination of genitals or breasts, or seeing strangers in the hospital room at night. Victims of sexual trauma may view breasts as sexual objects and not appropriate for contact with the infant. A red flag for identifying the sexual abuse survivor may be the ability to only give the infant pumped breast milk. Furthermore, this population of women may develop hostile or uncomfortable feelings toward the infant due to the infant's physical need for the maternal body.[21] Poor self-confidence in the ability to provide appropriate nutrition with the maternal body, which they may view as damaged or inadequate due to medical comorbidities, years of drug use,

and/or exposure to abuse, may corrupt early choices to breast-feed.[21]

Psychosocial factors

Psychosocial factors may also play a role in the decision to breast-feed for women with substance use disorders. Logistical concerns, such as the daily need to get to a treatment facility for medication that may not allow infants, may make breast-feeding challenging. A lack of role models for successful lactation or available family supports are not uncommon in this population. More than 1 breast-feeding mother has been discouraged by a significant other or relative who feels that the infant will be harmed by the maternal taking of methadone or buprenorphine or the fear that a maternal relapse will harm the infant.

The substance-exposed infant

The infant's symptoms related to substance exposure can make the process of breast-feeding challenging. For example, an infant with poor state control may have difficulty achieving and sustaining a drowsy or quiet alert state necessary for breast-feeding. Hypertonicity or excessive movement of the extremities can make physically positioning the infant on the breast for latching on and feeding difficult. An infant with suck/swallow incoordination may be unable to properly position the nipple in his or her mouth and lose breast milk when sucking due to poor latching or poorly coordinated suck/swallowing.

Substance-exposed infants may be unable to transmit easily interpretable cues that can affect dyadic communication. As examples, poorly interpretable/interpreted cues (ie, misinterpreting infant discomfort or irritability) can lead to attempted feeds for pacification when an infant is not hungry or an infant who receives an insensitive response to a hunger cue (ie, the mother interprets the infant crying as irritability and not hunger) and is allowed to get to an insulated crying state in which the capacity for feeding is reduced or nonexistent. For infants at risk for NAS, irritability and/or sleeplessness associated with hunger and a mother who misinterprets infant cues or does not have adequate milk supply can lead to initiation or escalation of pharmacotherapy when it may be unwarranted.

The provider and the environment

There are challenges that face the provider who encounters women with substance use disorders who wish to breast-feed. Frequently, the provider has little or no information to be able to make a decision to promote or disallow breast-feeding, such as drug abuse/treatment histories or psychiatric comorbidities. There often exists a problem with clear identification of women with substance use disorders. Current research demonstrates that maternal self-report of substance use during pregnancy is markedly inaccurate.[22] Providers may lack clear guidelines regarding this topic and may lack the training requisite to address the substance-dependent and/or psychiatrically impaired mother to be able to effectively treat the dyad. Lack of time to adequately and confidentially assess and understand women with substance use disorders in a busy nursery or postpartum setting can lead to a skewed understanding of the maternal history and functioning. Formula provided as the default feeding as a "safer" method of feeding the infant while these factors are considered in the immediate postpartum period may become the feeding method of choice if the mother is a poor self-advocate, as many women with substance use disorders are. Miscommunications and conflicting advice provided to women with substance use disorders are frequent and often arise from different knowledge bases regarding addiction among various treating professionals. Hesitancy on the part of treating professionals and perceived by women with substance use disorders can reinforce self-doubt about breast-feeding among women who lack self-confidence or are ambivalent about breast-feeding.

MARIJUANA USE AND LACTATION

While other substances of abuse and lactation have been discussed, albeit sparsely, in the literature, there are many issues surrounding the use of marijuana and lactation that make this topic particularly confusing to providers. Marijuana use is becoming legal in many states in the United States and is one of the most commonly used drugs in pregnancy and during lactation.[23] As medical use and promarijuana advocacy become more frequent in the United States, marijuana use has increased among all groups including pregnant women.[24] Marijuana use and dependence have been associated with a wide range of psychiatric disorders,[25] and up to 50% of users report impaired control over their use.[26] This makes detection of a woman who is marijuana using at or near term fraught with concern for other factors that may affect the care of the infant. Marijuana is considered by many to be a harmless recreational agent despite evidence that cannabis exposure during periods of critical brain development has the propensity to significantly adversely affect neurodevelopmental and behavioral outcomes.[27] There is uncertainty about short- and long-term implications of marijuana use during lactation.[27] Providers are widely divided on the decision to encourage versus disallow

breast-feeding in this population and seek appropriate responses to these questions as they arise in the face of sparse and/or definitive research in this area.

The main compound in marijuana is delta[9]-tetrahydrocannabinol (Δ^9THC). It is the major cannabinoid in exhaled breath after smoking, where it is present for up to 2 to 4 hours after smoking a single THC cigarette.[28] The potency of marijuana has increased 4 times in the last 30 years.[5] In animal models, early exposure to THC can recalibrate the sensitivity of the reward system to other drugs.[29] Passive exposures should be considered in marijuana-using mothers, as the infant can potentially be exposed to a large dose. THC can be concentrated in breast milk at up to 8 times plasma in daily users, is secreted into breast milk, and absorbed and metabolized by the infant.[30] Marijuana exposure via breast milk has been associated with no developmental effects[31] and conversely delayed motor development at 1 year.[32] Infant effects of sedation, growth delay,[33] low tone, and poor sucking[34] have been described.

It is difficult for providers to differentiate a "casual/light" versus a "chronic/heavy" or otherwise impaired user of marijuana in the postpartum period. Maternal self-report of substance use in the immediate postpartum period is notoriously unreliable due to multiple social and legal pressures for women to deny substance use. Urine tests for cannabis can stay positive for weeks after last use in heavy users, making it impossible to differentiate new use from residual excretion with commonly used screening tests.[35] This makes routine urine toxicology screening for marijuana, which also fails to determine quantitative exposure, of little value. The long urine half-life makes pumping and dumping problematic for the establishment of lactation. It is unlikely that women who have used marijuana near term can establish lactation with a prolonged period of discarding pumped breast milk until urine toxicology returns THC-negative findings.

It is unknown if women with positive urine toxicology screens at the time of delivery are more likely to be heavy or chronic users of marijuana. However, if one considers that substance use in the general population of pregnant women declines over the course of gestation for marijuana,[36] it would stand to reason that women who are using marijuana in the third trimester are more likely to be users who may have impaired control over their use. Furthermore, marijuana remains a category I controlled drug and an illicit substance despite individual state laws, and there are many universal guidelines that do not permit breast-feeding in women using illicit substances (ie, http://www.guidelines.gov/content.aspx?id=15262; SAMHSA TIP 43). Guidelines, such as those published by the American Academy of Pediatrics,[37] which find THC use and breast-feeding contraindicated, are used by judges and in legal decision making, which can place a marijuana-using lactating woman and a recommending provider at legal risk. It is necessary to consider that it may represent a missed opportunity to assist a newly postpartum woman with finding acceptable treatment of a substance use or psychiatric disorder, to provide intensive postnatal services to at risk dyads, or to detect an infant at risk for harm by minimizing marijuana use detected at the time of delivery.

STRATEGIES TO BREAK THE BARRIERS TO LACTATION

Given the multiple concerns that are evident in this population, it is clear that there are risks to lactation that exist in women with substance use disorders that can outweigh even large benefits of breast milk and breast-feeding. It therefore becomes the task of the provider faced with the substance-dependent woman who wishes to breast-feed to determine the correct population (where benefit outweighs risk) versus the entire population (where, in some dyads, risk outweighs benefit) for endorsement of lactation. This decision weighs on the thoughtful and comprehensive evaluation of the mother, the infant, the dyad, and conditions and attitudes within the healthcare environment.

Evaluation of the mother

Careful evaluation of the woman with a substance use disorder who wishes to breast-feed is a crucial first step. This includes evaluation for human immunodeficiency virus infection, active substance use, and any other medical conditions or medications that might be used in the postpartum period that are contraindicated in lactating women. Further risks to sobriety in abstinent women with substance use disorders, if present, must be defined. Breast-feeding should not be viewed as a method to promote abstinence in women who are not stable in their recovery from substance use or who are only able to maintain sobriety in inpatient settings. The mother's drug use and treatment history, psychiatric status, violence/abuse history and plans for medical and pediatric care, and family and community supports must be explored in a nonjudgmental fashion. Every woman who is in MAT (with methadone or buprenorphine) has a treatment provider that has developed an individualized treatment plan, and it is appropriate to speak to these providers with maternal written consent. Women with substance use disorders who are identified as such in the perinatal period can be

referred to an appropriate substance abuse treatment facility. Medication-assisted treatment is not a contraindication to breast-feeding in stable women. Since only low concentrations of these medications are evident in breast milk as noted in Table 2, it is not necessary to wean infants off of breast milk from lactating women in MAT.

Women with psychiatric comorbidities are more likely to have enhanced difficulties in the postnatal period; these can include intense guilt and/or lack of maternal self-confidence, and increased symptoms of depression or anxiety. These maternal feelings may be exacerbated if the milk supply is perceived as inadequate, if there is discomfort putting the infant to breast, or if the infant is not calmed with nonpharmacologic techniques. Assistance from existing psychiatric care providers, or assistance in finding an acceptable provider, is appropriate. Similarly, symptoms related to violence exposure may be greater in the perinatal period or may be newly detected, as many women in this circumstance view abuse as "normal." Among women who have been exposed to sexual violence, difficulties in cleaning the genital area of the infant, particularly female infants, may become apparent and should prompt a thoughtful discussion of their history. Facilitation of a trusting relationship that allows disclosure of a history of abuse and/or psychiatric symptoms is key. Compassionate and nonjudgmental providers can use open-ended questions in a private setting about feelings and perceptions related to the breast-feeding process.

Finally, even in some stable and abstinent drug-dependent women, pressures that may be related to breast-feeding in the postpartum period can threaten emotional stability and sobriety. For example, feelings surrounding lactation in a sexual abuse survivor, or maternal anxiety triggered by trying to breast-feed an infant with NAS, might trigger drug cravings or elopement from substance abuse treatment in some women. While breast milk does provide many significant benefits, the mother's sobriety and adherence to substance abuse treatment are likely to be of greater long-term benefit for both aspects of the dyad. It is sometimes necessary to suggest to the mother pumping and feeding the infant breast milk using a bottle or to switch to formula when that is a more appropriate choice.

Evaluation of the substance-exposed infant

As with the mother, careful evaluation of the substance-exposed infant is an important feature in the consideration of lactation in the substance-exposed dyad. It is imperative that the neonatal medical status, medications, and neurobehavioral display related to NAS be fully evaluated and understood. Assessment of manifestations of difficulties in sensory modulation, as well as triggers for dysregulation, is necessary for each substance-exposed newborn due to the frequent manifestation of hyper- or hyposensory responsivity among this population of infants.[38,39] For effective latching and feeding, infants must sense and react properly to a variety of tactile, kinesthetic, and proprioceptive, olfactory, visual, and auditory inputs at the same time that they must coordinate sucking, swallowing, and breathing. One or several of these functions may be compromised in this population of infants. If an infant of a woman with a substance use disorder fails to latch on or feed, the underlying cause of the infant's distress and inability to latch or suck/swallow effectively at the breast should be identified and the services of a knowledgeable

Table 2. Maternal opioid addiction treatment agents and lactation

Medication	Concentration in breast milk	Infant dose (calculated)	Other
Methadone	21.0-612.0 ng/mL[59,60]	0.004-0.0152 mg/d[59] 0.038 mg/kg/d[60]	M/P ≈ 0.40[59,60] Concentration in infant plasma is low: 2.2-8.1 ng/mL[59]
Buprenorphine	0.83-8.27 ng/mL[61]	0.12-1.24 μg/kg/d	0.26 μg/kg/d Buprenorphine is poorly bioavailable if taken orally
Naltrexone (single case report)	1.7 ng/mL[62]	0.26 μg/kg/d	M/P = 1.9
Buprenorphine-Naltrexone	No data	No data	In a case series of $n = 3$, no adverse effects reported[63]

Abbreviation: M/P, milk to maternal plasma ratio.

lactation consultant and/or occupational therapist may be necessary.

Factors that may cause sensory dysregulation during breast-feeding can include environmental (ie, tactile, auditory, visual) or internal (ie, gas, bowel movements) stimuli. Other factors may be related to inappropriate environmental (ie, overstimulating) or communication/handling (ie, misinterpretation of cues, rough or insensitive handling). For successful breast-feeding, evaluation of the environment prior to time for an infant feeding is necessary to ensure that there are no triggers for neurobehavioral dysregulation in the infant, such as maternal discomfort or apprehension, room temperature, or dysregulating stimuli. Oral sensitivities can interfere with latching and can be addressed by gradually introducing the nipple with small amounts of breast milk while monitoring the infant for signs of overstimulation. Infants who are overstimulated by visual stimuli might feed better in darkened rooms without looking at the mother's face; those with auditory sensitivities might feed better in a quiet room. Tactile sensitivities may be exacerbated by blankets that are too rough or too fluffy, monitor wires or security devices, or pressure on excoriated skin, all of which can be detected by careful observation of the infant and his or her responses and avoided when present.

The ability of the infant to modulate and control behavioral states is necessary for successful lactation. The expression of NAS is state dependent, and frequently infants with NAS have difficulty with state control, or the orderly progression through behavioral states from quiet sleep to crying.[40] Since breast-feeding must occur in a drowsy, quiet awake, or mildly irritable state, assisting the fragile infant with progression from a sleep state onto the breast can improve breast-feeding success. Instituting a feeding prior to the escalation to an irritable or insulated crying state can help in these infants. If the infant is receiving medication for NAS, it is necessary to understand of the control of arousal state in the infant in relation to feeding to determine the best time to give the medication (before, during, or after feeding). Some infants who receive medication before feeding are unable to maintain an alert state for the duration of feeding. Other newborns who are irritable and disorganized do best if medication is given before feeding so that they are able to be calm and to latch and suck/swallow. Still other newborns who exist in between these 2 extremes may feed best if given medication during a feed, although lactation needs to be interrupted to medicate the infant.

One frequently encountered and often difficult to resolve problem is the breast-fed infant who is being medicated for NAS and the effect of feeding schedules on scoring and medication. Breast-fed infants may feed more frequently and sleep for shorter periods of time than formula-fed infants. These factors may represent normal physiology and not necessarily NAS pathology. Instead, the scoring tool being used to evaluate the infant can be adapted to individual breast-feeding schedules, perhaps by eliminating the sleeping items. Medication for NAS may need to be delivered in smaller amounts at more frequent intervals to coincide with infant feeds.

Muscle tone problems may affect the infant's ability to function effectively at the breast. Positioning the infant on the breast must include strategies to reduce hypertonic posturing when it is present, including containment holding/swaddling and a flexed infant posture. This can be combined with hand holding in front of the body (ie, without one infant arm around the mother's side, which can predispose to arched posturing and promote hypertonicity) or containment of the lower extremities if tremors are present. Head thrashing can be addressed by containment holding of the infant's head and gentle pressure to the occiput if tolerated. Careful attention to the positioning of the infant tongue during latching is necessary, as many infants with NAS can hold the tongue on top or to the side of the nipple.

As important as it is to understand the infant and the mother, it is equally necessary to understand the dyad and their communication, such as the substance-affected infant's capacity to transmit interpretable cues (ie, indicating hunger, overstimulation, the need for position change) and the maternal interpretation and ability to provide a sensitive response to those cues. Nonpharmacologic care for the dyad,[38] which is the standard of care for all women with substance use disorders and their infants, is applied beginning at birth,

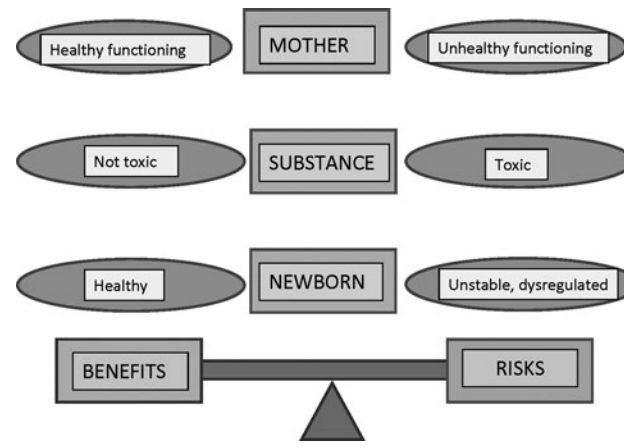

Figure 1. Weighing the benefits and risks of lactation for the substance-exposed dyad.

Table 3. **Published breast-feeding guidelines**

Academy of Breastfeeding Medicine: http://www.bfmed.org/Media/Files/Protocols/Protocol%2021%20English.pdf[64]
World Health Organization: http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en[65]
American Academy of Pediatrics: http://pediatrics.aappublications.org/content/129/3/e827.full[37]
American College of Obstetricians and Gynecologists: http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Health-Care-for-Underserved-Women/Opioid-Abuse-Dependence-and-Addiction-in-Pregnancy[66]
Centers for Disease Control and Prevention: http://www.cdc.gov/breastfeeding/disease/index.htm[67]

or ideally during pregnancy in the form of education for the mother. Assisting mothers with understanding the infant's communication patterns and providing sensitive responses to cues can promote and sustain breast-feeding in appropriate dyads.

The healthcare provider(s) and the environment

Providers treating women with substance use disorders must carefully assess the risks/benefits associated with lactation (see Figure 1) and consider the infant's functioning (stable vs dysregulated), the substance(s) of exposure (toxic vs nontoxic), and the mother (stable vs unstable).

There are several published guidelines (see Table 3) for lactation in women with substance use disorders, and in general, they do not promote breast-feeding among women actively using illicit or misusing licit substances, such as benzodiazepines or clonidine.

Understanding addiction as a chronic and relapsing disease that can produce neural changes that can affect the way mothers view the infant is a necessary first step for providers. Understanding the neonatal capacities and providing interventions that support individual signs of stress are equally as necessary.[41] Similarly, understanding and utilizing available resources, including substance abuse treatment facilities that will accept women (ie, are gender specific) and their infants, psychiatric services, support groups, social services support to assist with housing and legal issues, and familial support systems, are important. Early pediatric care that is identified by or to the mother prior to hospital discharge is vital for questions regarding the infant's resolving symptoms of NAS and for continued lactation. It is critical to address the mother in a nonjudgmental fashion, as the breast-feeding process can be easily undone by overtly or covertly pejorative attitudes and statements, particularly by the nursing staff[42] who do not intend harm. An example is referring to the substance-exposed infant in misinterpretable terms (ie, "If your baby was a normal baby we would not have to keep him for observation," or referring to substance-exposed infants as "addicted newborns"). Similarly, the provision of formula as a default feeding, or because the direct care staff is more comfortable with this option, is inappropriate for these women who meet criteria for breast-feeding and wish to do so.

The nursing staff may be most poised to play a valuable role in the treatment of postpartum women with substance use disorders and their infants,[43] particularly during lactation. Communication between specialties and other services involved in the dyad's care can optimize outcomes and minimize conflicting advice. Communicating appropriately with the family while protecting the mother's confidentiality, particularly around issues associated with MAT, can be difficult, but familial supports can be beneficial to continued breast-feeding. Providers must be prepared to act if the mother returns to active drug use and offer formula and options for substance abuse treatment in this case. Finally, a nonbiased and consistent interdisciplinary approach and a supportive environment for both aspects of the dyad during the hospital stay and beyond are critical to breast-feeding success and overall well-being of the dyad.

References

1. Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: summary of national findings. http://beta.samhsa.gov/data/sites/default/files/NSDUHresultsPDFWHTML2013/Web/NSDUHresults2013.pdf. Accessed October 15, 2014.
2. Patrick SW, Schumacher RE, Bennyworth BD, Krans EE, McAllister JM, Davis MM. Neonatal abstinence syndrome and associated health care expenditures, United States, 2000-2009. *JAMA*. 2012;307(18):1934–1940.
3. Gray T, Eiden R, Leonard K, et al. Identifying prenatal cannabis exposure and effects of concurrent tobacco exposure on neonatal growth. *Clin Chem*. 2010;56:1442–1450.
4. Desai A, Mark K, Terplan M. Marijuana use and pregnancy: prevalence, associated behaviors and birth outcomes. *Obstet Gynecol*. 2014;123(suppl 1):46S.
5. ElSohly MA. *Potency Monitoring Program Quarterly Report No. 123—Reporting Period: 09/16/2013-12/15/2013*. Oxford, MS: National Center for Natural Products Research, University of Mississippi; 2014.
6. Centers for Disease Control and Prevention. Breastfeeding report Card. http://www.cdc.gov/breastfeeding/pdf/2013BreastfeedingReportCard.pdf. Published 2013. Accessed February 13, 2015.
7. Chapman SL, Wu LT. Postpartum substance use and depressive symptoms: a review. *Women Health*. 2013;53(5):479–503.

8. Frank DA, Bauchner H, Zuckerman BS, Fried L. Cocaine and marijuana use during pregnancy by women intending and not intending to breast-feed. *J Am Diet Assoc*. 1992;92(2): 215–217.
9. Kendall-Tackett K, Cong Z, Hale TW. Depression, sleep quality, and maternal well-being in postpartum women with a history of sexual assault: a comparison of breast-feeding, mixed-feeding, and formula-feeding mothers. *Breastfeed Med*. 2013;8(1):16–22.
10. Volkow ND, Baler RD. Addiction science: uncovering neurobiological complexity. *Neuropharmacology*. 2014; 76(pt B):235–249.
11. Rutherford HJ, Williams SK, Moy S, Mayes LC, Johns JM. Disruption of maternal parenting circuitry by addictive process: rewiring of reward and stress systems. *Front Psychiatry*. 2011;2:37.
12. Haller DL, Miles DR, Dawson KS. Factors influencing treatment enrollment by pregnant substance abusers. *Am J Drug Alcohol Abuse*. 2003;29:117–131.
13. Fitzsimons HE, Tuten M, Vaidya V, Jones HE. Mood disorders affect drug treatment success of drug dependent pregnant women. *J Subst Abuse Treat*. 2007;32:19–25.
14. Oei JL, Abdel-Latif ME, Craig F, Kee A, Austin MP, Lui K. Short-term outcomes of mothers and newborn infants with comorbid psychiatric disorders and drug dependency. *Aust N Z J Psychiatry*. 2009;43:323–331.
15. O'Brien M, Buikstra E, Hegney D. The influence of psychological factors on breast-feeding duration. *J Adv Nurs*. 2008;63(4):397–408.
16. Ystrom E. Breast-feeding cessation and symptoms of anxiety and depression: a longitudinal cohort study. *BMC Pregnancy Childbirth*. 2012;12:36.
17. Fortinguerra F, Clavenna A, Bonati M. Psychotropic drug use during breast-feeding: a review of the evidence. *Pediatrics*. 2009;124(4):e547–e556.
18. Velez ML, Montoya ID, Jansson LM, et al. Exposure to violence among substance-dependent pregnant women and their children. *J Subst Abuse Treat*. 2006;30(1):31–38.
19. Prentice JC, Lu MC, Lange L, Halfon N. The association between reported childhood sexual abuse and breast-feeding initiation. *J Hum Lact*. 2002;18:219–226.
20. Averbuch T, Spatz D. Breast-feeding mothers and violence: what nurses need to know. *MCN Am J Matern Child Nurs*. 2009;34(5):284–289.
21. Kendall-Tackett K. Breast-feeding and the sexual abuse survivor. *J Hum Lact*. 1998;14:125–130.
22. Beatty JR, Chase SK, Ondersma S. A randomized study of the effect of anonymity, quasi-anonymity and certificates of confidentiality on postpartum women's disclosure of sensitive information. *Drug Alcohol Depend*. 2014;134: 280–284.
23. United Nations Office on Drugs and Crime. World drug report. http://www.undoc.org/wdr/en/cannabis.html. Published 2013. Accessed October 15, 2014.
24. Volkow ND, Compton WM, Weiss SR. Adverse health effects of marijuana use. *N Engl J Med*. 2014;371(9):879.
25. Warner TD, Roussos-Ross D, Behnke M. It's not your mother's marijuana: effects on maternal-fetal health and the developing child. *Clin Perinatol*. 2014;41(4):877–894.
26. Hall W, Degenhardt L, Teesson M. Cannabis use and psychotic disorders: an update. *Drug Alcohol Rev*. 2004;23(4):433–443.
27. Jaques SC, Kingsbury A, Henshcke P, et al. Cannabis, the pregnant woman and her child: weeding out the myths. *J Perinatol*. 2014;34(6):417–424.
28. Himes SK, Scheidweller KB, Beck O, Gorelick DA, Desrosiers NA, Huestis MA. Cannabinoids in exhaled breath following controlled administration of smoked cannabis. *Clin Chem*. 2013;59(12):1780–1789.
29. Dinieri JA, Hurd YL. Rate models of prenatal and adolescent cannabis exposure. *Methods Mol Biol*. 2012;829:231–242.
30. Perez-Reyes M, Wall ME. Presence of delta^9-tetrahydrocannabinol in human milk. *N Engl J Med*. 1982;307(13):819–820.
31. Tennes K, Avitable N, Blackard C, et al. Marijuana: prenatal and postnatal exposure in the human. *NIDA Res Monogr*. 1985;59:48–60.
32. Astley SJ, Little RE. Maternal marijuana use during lactation and infant development at one year. *Neurotoxicol Teratol*. 1990;12(2):161–168.
33. Hale TW. *Medications and Mother's Milk*. Amarillo, TX: Hale Publishing, LP;2006.
34. Liston J. Breast-feeding and the use of recreational drugs—alcohol, caffeine, nicotine and marijuana. *Breastfeed Rev*. 1998;6(2):27–30.
35. Buchan BJ, Dennis ML, Tims FM, Diamond GS. Cannabis use: consistency and validity of self-report, on-site urine testing and laboratory testing. *Addiction*. 2002;97:98–108.
36. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *The NSDUH Report: Substance Use Among Women During Pregnancy and Following Childbirth*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2009. http://www.gmhc.org/files/editor/file/a_pa_nat_drug_use_survey.pdf. Accessed December 4, 2014.
37. The American Academy of Pediatrics, Section on Breastfeeding. Policy statement. *Pediatrics*. 2012;129(3):e827–e841.
38. Velez M, Jansson LM. Nonpharmacologic care of the opioid dependent mother and her newborn. *J Addict Med*. 2008;2(3):113–120.
39. Jansson LM, Velez M. Neonatal abstinence syndrome. *Curr Opin Pediatr*. 2012;24(2):252–258.
40. Velez ML, Jansson LM, Schroeder J, Williams E. Prenatal methadone exposure and neonatal neurobehavioral functioning. *Pediatr Res*. 2009;66(6):704–709.
41. Maguire D. Care of the infant with neonatal abstinence syndrome. *J Perinat Neonatal Nurs*. 2014;28:204–210.
42. Demirci JR, Bogen DL, Klionsky Y. Breast-feeding and methadone therapy: the maternal experience. *Subst Abuse*. 2014:4:1–6.
43. Brandon AR. Psychosocial interventions for substance use during pregnancy. *J Perinat Neonatal Nurs*. 2014;28: 169–177.
44. Winecker RE, Goldberger BA, Tebbett IR, et al. Detection of cocaine and its metabolites in breast milk. *J Forensic Sci*. 2001;46(5):1221–1223.
45. Chasnoff IJ, Lewis DE, Squires L. Cocaine intoxication in a breast-fed infant. *Pediatrics*. 1987;80:836–838.
46. Bartu A, Dusci LJ, Ilett KF. Transfer of methylamphetamine and amphetamine into breast milk following recreational use of methylamphetamine. *Br J Clin Pharmacol*. 2009;67(4): 455–459.
47. Steiner E, Villen T, Hallberg M, Rane A. Amphetamine secretion in breast milk. *Eur J Clin Pharmacol*. 1984;27: 123–124.
48. Ariagno R, Karch SB, Middleberg R, Stephens BG, Valdès-Dapena M. Methamphetamine ingestion by a breast-feeding mother and her infant's death: *People v Henderson JAMA*. 1995;274(3):215.
49. Kaufman KR, Petrucha RA, Pitts FN, Weekes ME. PCP in amniotic fluid and breast milk: case report. *J Clin Psychiatry*. 1983;44(7):269–270.
50. Rubin ET, Lee A, Ito S. When breast-feeding mothers need CNS-acting drugs. *Can J Clin Pharmacol*. 2004;11(2): e257–e266.

51. Martens PR. A sudden infant death like syndrome possibly induced by a benzodiazepine in breast-feeding. *Eur J Emerg Med*. 1994;1(2):86–87.
52. Kelly LE, Poon S, Madadi P, Koren G. Neonatal benzodiazepines exposure during breast-feeding. *J Pediatr*. 2012;161(3):448–451.
53. Mennella JA, Gerrish CJ. Effects of exposure to alcohol in mother's milk on infant sleep. *Pediatrics*. 1998;101(5):E2.
54. Little RE, Lambert MD, Worthington-Roberts B. Drinking and smoking at 3 months postpartum by lactation history. *Paediatr Perinat Epidemiol*. 1990;4:290–302.
55. Mennella JA, Beauchamp GK. The transfer of alcohol to human milk. Effects on flavor and the infant's behavior. *N Engl J Med*. 1991;325(14):981–985.
56. Lam J, Kelly L, Ciszkowski C, et al. Central nervous system depression of neonates breastfed by mothers receiving oxycodone for postpartum analgesia. *J Pediatr*. 2012;160:33–37.
57. Hendrickson RG, McKeown NJ. Is maternal opioid use hazardous to breast-fed infants? *Clin Toxicol*. 2012;50(1):1–14.
58. West, McKeown NJ, Hendrickson RG. Methadone overdose in a breast-feeding toddler. *Clin Toxicol*. 2009;47:7.
59. Jansson LM, Choo R, Velez ML, et al. Methadone maintenance and breast-feeding in the neonatal period. *Pediatrics*. 2008;121(1):106–114.
60. Bogen DL, Perel JM, Helsel JC, Hanusa BH, Thompson M, Wisner KL. Estimated infant exposure to enantiomer-specific methadone levels in breast milk. *Breastfeed Med*. 2011;6(6):377–384.
61. Ilett KF, Hackett P, Gower S, Doherty DA, Hamilton D, Bartu AE. Estimated dose exposure of the neonate to buprenorphine and its metabolite norbuprenorphine via breast milk during maternal buprenorphine substitution treatment. *Breastfeed Med*. 2012;7(4):269–274.
62. Chan CF, Page-Sharp M, Kristensen JH, O'Neil G, Ilett KF. Transfer of naltrexone and its metabolite 6,beta-naltrexol into human milk. *J Hum Lact*. 2004;20(3):322–326.
63. Debelak K, Morrone WR, O'Grady KE, Jones HE. Buprenorphine-naloxone in the treatment of opioid dependence during pregnancy—initial patient care and outcome data. *Am J Addict*. 2013;22:252–254.
64. Jansson LM. ABM clinical protocol #21: guidelines for breastfeeding and the drug dependent woman. *Breastfeed Med*. 2009;4(4):225–228.
65. World Health Organization. Guidelines for identification and management of substance use and substance use disorders in pregnancy. http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en. Published 2014. Accessed February 13, 2015.
66. American College of Obstetrics and Gynecology, Committee on Health Care for Underserved Women and the American Society of Addiction Medicine. Opioid abuse, dependence and addiction in pregnancy. http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Health-Care-for-Underserved-Women/Opioid-Abuse-Dependence-and-Addiction-in-Pregnancy. Published 2012. Accessed February 13, 2015.
67. Centers for Disease Control and Prevention. Breast-feeding. http://www.cdc.gov/breastfeeding/disease/index.htm. Published 2015. Accessed February 13, 2015.

The CE test for this article is available online only. Log onto the journal website, www.JPNONline.com, or to www.NursingCenter.com/CE/JPN to access the test. For more than 39 additional continuing education articles related to perinatal and neonatal nursing, go to NursingCenter.com\CE.

Instructions:

- Read the article. The test for this CE activity is to be taken online at www.NursingCenter.com/CE/JPNN.
- You will need to create (its free!) and login to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Williams & Wilkins online CE activities for you.
- There is only one correct answer for each question.
- A passing score for this test is 13 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Williams & Wilkins: 1-800-787-8985.

Registration Deadline: December 31, 2017

Provider Accreditation:

Lippincott Williams & Wilkins, publisher of Journal of Perinatal Nursing, will award 3 contact hours for this continuing nursing education activity.

Lippincott Williams & Wilkins is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 3 contact hours. Lippincott Williams & Wilkins is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida #50-1223. Your certificate is valid in all states.

Disclosure Statement:

The authors and planners have disclosed that they have no financial relationships related to this article.

Payment:

- The registration fee for this test is $29.95.