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Academy of Breastfeeding Medicine Clinical Protocol #21: Breastfeeding in the Setting of Substance Use and Substance Use Disorder (Revised 2023)

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Abstract

Background: The Academy of Breastfeeding Medicine (ABM) revised the 2015 version of the substance use disorder (SUD) clinical protocol to review the evidence and provide updated literature-based recommendations related to breastfeeding in the setting of substance use and SUD treatments.
Key Information: Decisions around breastfeeding are an important aspect of care during the peripartum period, and there are specific benefits and risks for substance-exposed mother–infant dyads.
Recommendations: This protocol provides breastfeeding recommendations in the setting of nonprescribed opioid, stimulant, sedative-hypnotic, alcohol, nicotine, and cannabis use, and SUD treatments. Additionally, we offer guidance on the utility of toxicology testing in breastfeeding recommendations. Individual programs and institutions should establish consistent breastfeeding approaches that mitigate bias, facilitate consistency, and empower mothers with SUD. For specific breastfeeding recommendations, given the complexity of breastfeeding in mothers with SUD, individualized care plans should be created in partnership with the patient and multidisciplinary team with appropriate clinical support and follow-up. In general, breastfeeding is recommended among mothers who stop nonprescribed substance use by the time of delivery, and they should continue to receive ongoing postpartum care, such as lactation support and SUD treatment. Overall, enhancing breastfeeding education regarding substance use in pregnancy and lactation is essential to allow for patient-centered guidance.

Keywords: breastfeeding, substance use disorder, opioids, alcohol, Cannabis

About ABM Protocols: *A central goal of the Academy of Breastfeeding Medicine (ABM) is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient. The ABM empowers health professionals to provide safe, inclusive, patient-centered, and evidence-based care. Women and others who are pregnant and lactating identify with a broad spectrum of genders, pronouns, and terms for feeding and parenting. There are two reasons ABM's use of gender-inclusive language may be transitional or inconsistent across protocols. First, gender-inclusive language is nuanced and evolving across languages, cultures, and countries. Second, foun-*

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dational research has not adequately described the experiences of gender-diverse individuals. Therefore, ABM advocates for and will strive to use language that is as inclusive and accurate as possible within this framework. For more explanation, please read ABM Position Statements on Infant Feeding and Lactation-Related Language and Gender (https://doi.org/10.1089/bfm.2021.29188.abm) and Breastfeeding as a Basic Human Right (https://doi.org/10.1089/bfm.2022.29216.abm).

Introduction

This guideline update aims to support clinicians working in partnership with pregnant and breastfeeding mothers who use nonprescribed substances and those with substance use disorders (SUDs) around breastfeeding decision-making. Guided by principles of patient-centered care, defined as care that is consistent with the needs, values, and desires of patients, the purpose of this guideline is to provide literature-based recommendations to aid clinicians in discussing the risks and benefits to breastfeeding for women and infants in the setting of maternal substance use and/or SUD treatment.

This update to the 2015 Academy of Breastfeeding Medicine (ABM) protocol includes multiple major revisions including the addition of substance-specific and SUD treatment-specific recommendations, guidance regarding perinatal toxicology testing, and changes to guidance on breastfeeding initiation timing in the setting of perinatal nonprescribed substance use.

ABM Protocols #7 (Model Maternity Policy to Support Breastfeeding),[1] #15 (Analgesia and Anesthesia for the Breastfeeding Mother),[2] and #18 (Use of Antidepressants in Breastfeeding Mothers)[3] may serve as useful adjuncts to this protocol.

Methods

We established independent working groups to develop an individualized search strategy for each topic area. Searches were restricted to published literature after 2015, the year of the previous guideline publication.[4] All articles identified were reviewed for relevance and quality, and those relevant articles were included in the annotated bibliography. Included articles were briefly summarized, and the level of evidence (LOE) was determined according to strength of recommendation taxonomy (SORT) criteria, with Level 1 evidence being the highest and Level 3 being the lowest quality of evidence.[5,6]

Using the SORT strength-of-recommendation (SOR) grading system, the authors rated recommendations as level A (based on consistent good-quality patient-oriented evidence), B (based on inconsistent or limited quality evidence), or C (based on consensus, usual practice, case series evidence, or opinion). Each recommendation was reviewed and required consensus from the authorship committee. Though the formal literature search was restricted to 2015 and beyond, articles published before this date are included in the guideline references where no new evidence has emerged since the previous ABM protocol.

Next, the relative infant dose (RID), a commonly used evidence-based tool to estimate infant drug exposure was reviewed. The RID is dependent on drug pharmacology, maternal exposure and metabolism into breast milk, infant gastric absorption, metabolism, and gestational age.[7,8] Substances with RID values <10% are generally considered safe for a breastfed infant and substances with RID values of >25% should be avoided in breastfeeding mothers.[7–9] Given that this guideline focuses on nonprescribed substances, and there is limited data available regarding breast milk exposure for most illicit substances, wherever pharmacokinetic and RID data are available for prescribed substances of similar pharmacokinetic and pharmacologic properties, we include this information to help inform decision-making. RID and other key pharmacokinetic measures of included substances are described in Tables 1 and 2. Half-life is included to help determine time for substance clearance from the breastmilk. In addition, medications enter breastmilk relative to maternal plasma concentration, thus peak effect is also included to guide timing of breastfeeding.[9]

Key Information

Background

Clinicians caring for pregnant patients and their newborns will commonly be tasked with making recommendations regarding breastfeeding in the context of nonprescribed substance use and SUD.[7,10–13] Globally, prevalence of SUD has increased between 2009 and 2016, with alcohol, opioid, and cannabis use disorders having the highest rates among women.[14] The United States (US) 2021 National Survey on Drug Use and Health (NSDUH) data found that 7.7%, 10.8%, and 9.8% of pregnant women reported past-month nonprescribed substance use, tobacco product use, and alcohol use, respectively.[15] Decisions around breastfeeding are an important aspect of the peripartum period for all mothers, but there are specific risks and benefits to consider among substance-exposed mother–infant dyads.

Beyond the well-established benefits in the general population,[16] breastfeeding is known to reduce the severity of neonatal opioid withdrawal syndrome (NOWS), such as decreasing the need for pharmacologic treatment and length of infant hospitalization.[17,18] In addition to the benefits for the infant, breastfeeding may also help mothers bond with their infant and thereby reduce stress and support their recovery.[19] However, risks associated with breastfeeding in individuals actively using nonprescribed substances include reduced parental ability to respond to infant feeding cues and infant substance exposure through breast milk, risking acute toxicity, reduced breastfeeding ability, and potential alterations in neonatal brain development.[20,21]

Facilitators and barriers to breastfeeding in individuals with SUD

Given the high rates of co-occurring mental illness, trauma, and social and structural inequities among pregnant people with SUD, comprehensive prenatal and addiction care are important to support substance use stabilization by delivery.[22–25] Interdisciplinary care models that include mental health care, addiction treatment, case management, and social support services combined with prenatal care have been shown to yield better obstetrical and neonatal outcomes.[26–29] Engagement with such services can support a shared

decision-making process that facilitates informed, individualized discussions regarding specific benefits and potential risks of breastfeeding.

However, many women with SUD avoid seeking prenatal care due to persistent stigma, fear of child removal, and punitive laws that criminalize substance use during pregnancy or mandate reporting to child services, even for those only receiving the recommended medications to treat their SUD.[30–33] Such policies deter pregnant women from seeking care, and among those that do, discourage them from starting medication treatments for SUD.[34–36] Some women may face additional barriers to substance use treatment due to cultural, social, and economic factors.[37] For example, structural racism in North America exacerbates barriers to care for Black, Indigenous, Latinx, and pregnant individuals of color who are more likely to undergo urine drug testing and child removal.[34,38–43] Individuals with SUD not engaged in prenatal care are more likely to be actively using nonprescribed substances at the time of delivery complicating breastfeeding guidance.[44]

Women with SUD are less likely to initiate and maintain breastfeeding compared to those without SUD.[45–47] Factors impacting breastfeeding include a high co-occurrence of medical and psychiatric conditions impacting lactation, pharmacotherapy impacting breast milk production, polysubstance use, pain with breastfeeding in the context of a SUD, and/or physical and sexual trauma histories that complicate breastfeeding experiences.[48–51] Related to structural health inequities, racism, and stigma individuals with SUD maybe also be distrustful of the breastfeeding recommendations they receive from providers.[50,52] Additionally, infant factors can also complicate breastfeeding in substance-exposed parent–infant dyads. Infants with NOWS may experience greater difficulty with latch, have significantly more weight loss leading to commercial milk formula supplementation, and have long hospitalizations resulting in greater parent–infant separation.[53–56]

Use of toxicology testing to guide breastfeeding decision-making

Universal screening for SUDs during pregnancy using a standardized validated screening tool is widely recommended including by the World Health Organization[57] and the American College of Obstetricians and Gynecologists.[58] The decision of whether or not to send toxicology testing on the mother and/or infant, and what type of toxicology testing is beyond the scope of these guidelines and should be informed by individual clinical contexts. Urine toxicology testing at the time of delivery will generally detect substances used within the previous 48–72 hours. However, nonprescribed fentanyl and its metabolites can persist in the urine for days to weeks after last use.[59] In addition, delta-9-tetrahydrocannabinol (THC) and metabolites can persist in the urine for 4–5 days after single-use, and up to 4 weeks in the setting of chronic use, complicating interpretation and testing utility to guide breastfeeding decision-making.[60]

In summary, urine drug testing can be a tool to inform breastfeeding guidance but has limitations. All urine drug testing must be interpreted within the clinical context including patient history and collateral information, and this should inform the need for further confirmatory testing (e.g., with gas chromatography).[61] In clinical contexts where testing is consistent with new or ongoing nonprescribed substance use, breastfeeding should be avoided until clearance of the substance.

Timing of nonprescribed use during pregnancy and breastfeeding initiation

Previous ABM guidelines recommended that women who had nonprescribed substance use in the 30–90 days before delivery be discouraged from breastfeeding. A single-site 2020 retrospective cohort study of 503 women receiving opioid use disorder (OUD) treatment found that the predictive value of postpartum substance use based on urine drug testing from the third trimester was only 36% and that urine drug testing at delivery had the strongest association with ongoing nonprescribed use postpartum.[62] In light of these findings, evidence showing that most substances are eliminated in hours to days rather than days to weeks,[21] and in line with more current breastfeeding decision-making practices,[63–65] women who discontinue nonprescribed substance use by or during the delivery hospitalization can be supported in breastfeeding initiation.

Mothers motivated to breastfeed who report recent nonprescribed substance use and/or have positive toxicology testing at delivery should be supported in expressing milk to establish milk production. The decision of whether to give expressed milk to the infant and when to start breastfeeding should be made using a multidisciplinary approach involving the patient and clinicians of both the parent–infant dyad. Ideally, before breastfeeding, sufficient time should pass to allow for substance clearance from breast milk. If a breastfeeding mother returns to nonprescribed substance use in the postpartum period, a similar approach of expressing milk and discarding milk and consultation with a multidisciplinary team should take place to inform breastfeeding decisions.

Breastfeeding counseling and supports for dyads with maternal SUD

There is limited evidence around specific interventions to best support breastfeeding among dyads with maternal SUD. Most published research on interventions to support breastfeeding in the setting of maternal SUD have reported on general treatment models for perinatal SUD and NOWS, with few studies evaluating specific breastfeeding support measures.[66,67] Clinician expertise suggests that supports and counseling should take a trauma-informed approach and span prenatal, intrapartum, and postpartum care.

Prenatal breastfeeding education specific to the context of SUD may help encourage more mothers with SUD to breastfeed.[68] Anticipatory guidance should include counseling on the impact of infant withdrawal, co-occurring conditions and treatments, smoking, and other factors that may affect lactation and infant feeding. Provider education and consistent institutional policies around breastfeeding among dyads with maternal SUD should be implemented.[69,70]

Specialized lactation support is required in the hospital for infants that experience NOWS due to the significant effect these symptoms have on infant feeding.[56] Both rooming-in and skin-to-skin positioning throughout the perinatal hospital stay are encouraged as they are associated with decreased NOWS symptoms and improved breastfeeding outcomes.[71,72] Ideally, dyads should continue to receive outpatient breastfeeding care that is responsive to existing social

supports, social isolation, mental health needs, and unique challenges such as expressing milk after hospital discharge. Multidisciplinary perinatal SUD programs are well positioned to integrate skilled lactation professionals, peer recovery/lactation counselors, and social support programs for breastfeeding dyads.

Opioids

There has been more than a fourfold increase in the number of deliveries impacted by OUD and a sevenfold increase in the rates of NOWS between 2000 and 2016 in the United States with similar increases in other high-income countries.[73–76] However, according to recent NSDUH data, the prevalence of opioid use during pregnancy appears to be declining in the United States from 1.2% to 0.4% in 2017 and 2019, respectively.[77] It is not clear how nascent shifts in drug supply from prescription opioids to synthetic fentanyl analogues and patterns of use where polysubstance use is more common will impact maternal opioid epidemiology and NOWS treatment.[78–81] Data on nonprescribed opioid use among breastfeeding individuals is lacking; therefore, epidemiologic inferences are made from data among pregnant individuals with OUD and opioid-exposed infants.

While there is a moderate amount of data on lactation pharmacokinetics of prescribed opioids (morphine, codeine, oxycodone, and tramadol), little is known regarding nonprescribed use, particularly of synthetic opioids, like fentanyl, adulterating up to 90% of the illicit opioid supply in parts of North America.[81–84] With this limitation in mind, understanding the pharmacokinetics of prescribed opioids can still inform risk–benefit assessments for clinicians working with individuals using nonprescribed opioids (Table 1).[13,85] In individuals taking short-term prescribed opioids (3–5 days), the RIDs are usually low, in the range of 1–5%, and breastfeeding is typically safe, though this is dependent on the total daily dose of the opioid in terms of risk for infant sedation and other adverse events.[2,13,85,86] Less is known regarding longer-term use (>5 days), but drug accumulation has been cited as a concern.[13] Tramadol has a US Food and Drug Administration (FDA) warning due to variable metabolism which may result in higher RID in some individuals, although there are no reports of effects in infants with parental tramadol use.

Table 1. Prescribed Opioids, Benzodiazepines, Stimulants, Non-Prescribed Stimulants, Alcohol, Nicotine, and Cannabis Pharmacokinetic Considerations to Inform Breastfeeding

Opioids	*Peak effect*[a]	*Half-life*[a]	*RID (%)*
Morphine	0.5–1 hour[237]	2–4 hours[237]	9.09–35[9]
Codeine	1–1.5 hours[237]	3 hours[237]	0.6–8.1[9]
Oxycodone	0.5–2 hours[237]	3–4 hours[237]	1.0–4.6[9]
Tramadol	2–3 hours[237]	6–7.5 hours[237]	2.9[9]
Benzodiazepines	*Peak effect*	*Half-life*	*RID (%)*
Diazepam	0.3–2.5 hours[237]	44–48 hours[237]	0.9–7.1[9]
Alprazolam	IR: 1–2 hours ER: 9 hours[237]	IR: 11 hours ER: 10–16 hours[237]	8.5[9]
Lorazepam	IR: 2 hours ER: 14 hours[237]	IR: 12 hours ER: 20 hours[237]	2.6–2.9[9]
Clonazepam	1–4 hours[237]	17–60 hours[237]	2.8[9]
Chlordiazepoxide	0.5–2 hours[237]	24–48 hours[237]	N/A
Stimulants	*Peak effect*	*Half-life*	*RID (%)*
Cocaine	0.5 hour[237]	1.5 hours[238]	N/A
Methamphetamine	2.5 hours[239]	4–5 hours[237]	N/A
MDMA	2–4 hours[237]	4–6 hours[237]	N/A
Cathinone	2.3 hours[240]	1.5 hours[240]	N/A
Amphetamine	IR: 3–4 hours ER:5–7 hours[237]	IR: 10–12 hours ER: 11–12 hours[237]	1.9–2.1[132]
Dexamphetamine	IR: 3 hours ER: 8 hours[237]	IR: 3–4 hours ER: 5–7 hours[237]	4.0–10.6[133]
Substance	*Peak effect*	*Half-life*	*RID (%)*
Alcohol	0.5–1.5 hours[237]	4–5 hours[237]	16[9]
Nicotine	0.25 hours[237]	1–2 hours[237]	N/A
Cannabis (THC)	0.25–0.5 hours[237]	25–36 hours[237]	0.4–8.7[9]

[a]Peak and half-life values reference adult pharmacokinetic data for a potential breastfeeding individual. The above prescribed opioid, benzodiazepine, and stimulant data are derived from oral route of administration. IV route of administration for equivalent IV medications have shorter peak effects, in the order of minutes. In intravenous route of administration, the half-lives for opioids may be shorter. For nicotine and cannabis, peak effect sand half-lives are for inhalation route of administration.

ER, extended release; IR, immediate release; IV, intravenous; MDMA, 3,4-methyl enedioxy methamphetamine; N/A, data not available; RID, relative infant dose; THC, delta-9-tetrahydrocannabinol.

The harms of nonprescribed opioid use and addiction are well described elsewhere,[87,88] but specific harms while breastfeeding include risk for parental sedation, reduced ability to respond to infant cues, and risk for bed-sharing infant injuries.[13,89] Though opioids theoretically increase prolactin, limited research that compared varying opioids, doses, and routes of administration found mixed results with either no effect on lactation versus delayed lactation.[90–95] Infant harms from active nonprescribed opioid use while breastfeeding includes risk for sedation, withdrawal, and respiratory depression.[13,89] Long-term impacts on infant cognitive development from opioid exposure during lactation are not known.

Sedative hypnotics

Data on the prevalence of nonprescribed sedative-hypnotic (benzodiazepines, z-drugs, gabapentin, and phenobarbital) use and use disorders in breastfeeding are lacking, but in the general population prescribed sedative-hypnotic use is more common among women than men.[96,97] Use of sedative hypnotics (prescribed and nonprescribed) affects 1.9% of pregnancies globally,[98] and rates of nonprescribed use and use disorders affect about 1.2% of US women.[15,99]

Moderate pharmacokinetic lactation data are available for prescribed benzodiazepines while other sedative-hypnotic drug data are limited. There is increasing toxicity of illicit benzodiazepine supply, where novel long-acting synthetic sedative-hypnotics are being more commonly reported.[100–103] Given that the treatment for sedative-hypnotic disorders typically includes a period of prescribed sedative-hypnotic use, it is useful to review the pharmacokinetics.

A recent study among 11 women taking prescribed benzodiazepines assessed maternal blood and breast milk samples at 3–6 days and 1 month postpartum.[104] RID values were found to be <10%, and no clinical abnormalities were noted in the infants, but older observational data found benzodiazepine use during breastfeeding may cause infant sedation and/or infant withdrawal (Table 1).[99,104–106] In light of conflicting data, a recent study developed a new safety scoring system of psychotropic medications during lactation based on a comprehensive review of the literature and found that benzodiazepines had a moderate safety profile, but a lack of data precluded safety assessments of other sedative-hypnotics.[107] Reviews of small observational and case report studies on prescribed z-drugs (e.g., zolpidem, zopiclone) find low RID levels of <10%, suggesting they may be safe during lactation, but data are limited.[108–110] Studies on nonprescribed phenobarbital and gabapentin use during breastfeeding are lacking, and breastfeeding recommendations for their prescription use in the setting of seizure or mood disorders can be found elsewhere.[111–115]

Breastfeeding-specific parental harms related to sedative-hypnotic use are similar to those of other sedating substances and include risk for sedation and reduced ability to respond to infant cues.[116] Infant harms from active nonprescribed sedative-hypnotic use while breastfeeding include risk for sedation, respiratory depression, tremors, and poor weight gain.[104,117] Data on the long-term impacts on infant development from sedative-hypnotic exposure during lactation are limited, but observational data have not found evidence of cognitive delay.[117,118]

Stimulants

Internationally, rates of stimulant use disorder in pregnancy vary from 0.1% to 1% of deliveries.[119,120] In the United States, according to the 2019 NSDUH, 1.79 million women aged between 15 and 44 years used nonprescribed stimulants (cocaine, methamphetamine, amphetamines, 3,4-methyl enedioxy methamphetamine (MDMA)) and/or made nonmedical use of stimulant medications in the past month.[77] While rates of cocaine use in pregnancy have declined over the past two decades, deliveries affected by amphetamine use have doubled.[121] Little data exist on the prevalence of nonprescribed stimulant use among breastfeeding mothers.

There is also limited data on the pharmacokinetics of cocaine and methamphetamine in breast milk. Animal and lab data suggest that the low molecular weight, solubility in nonpolar solvents, lipid solubility, and high bioavailability of these substances may contribute to a high RID.[21,122,123] Clinical data are limited to the case report level with minimal maternal dose information to inform the RID of cocaine[123–126] and methamphetamine (Table 1).[127,128] In case reports, cocaine and its metabolites were cleared from infant urine toxicology testing by 60 hours and methamphetamine by 100 hours.[127,129] Additionally, there is limited research examining the effects of the nonprescribed use of stimulants such as amphetamine and dexamphetamine during breastfeeding.

Though research on prescribed stimulant use during lactation may not be a comparable standard,[130] understanding prescribed stimulant pharmacokinetics can inform risk discussions. Studies have found that prescribed amphetamines accumulate in breast milk at rates higher than maternal plasma levels during lactation.[131–133] Yet no adverse events were observed in infants exposed to dexamphetamine through breast milk.[133] Very limited data exist on cathinone or MDMA lactation pharmacokinetics, but due to structural similarities to other amphetamines and a single case report, evidence suggests that they both likely accumulate in breast milk.[134–136] Further pharmacokinetic details of stimulants are summarized in Table 1.

Parental harms related to stimulant use specific to breastfeeding include risk for reduced breast milk production in the setting of chronic use secondary to hypoprolactinemia.[137–140] Case report level data describe the following potential harms in infants exposed to nonprescribed stimulants: diarrhea, vomiting, abdominal pain, weight loss, tachycardia, tachypnea, hypertension, hypothermia, irritability, tremors, sleep disturbance, and seizures.[129,141,142] There are three documented cases of infant death related to methamphetamine breast milk exposure.[143–145] Data on the long-term effects of infant cocaine and methamphetamine exposure during breastfeeding are lacking.

Alcohol

Globally, alcohol is the most commonly misused substance among women.[14] Binge drinking in the United States is highest among individuals aged 25–34 years, which includes individuals of childbearing age.[146] Between 24% and 28% of pregnant individuals report at least one binge drinking episode in early pregnancy.[147] The prevalence of alcohol use during pregnancy is stable according to U.S. national surveillance data from the NSDUH, with 197,000 pregnant

individuals reporting past month alcohol use in 2019.[148] A recent European study of over 7,000 individuals from 11 countries found that 16% of pregnant women drank alcohol during pregnancy.[149] Occasional alcohol use during lactation remains common, reported in up to 50–82% of breastfeeding people.[150–152] The reported incidence of binge drinking among breastfeeding mothers is significantly lower at 6–7%.[153]

Pharmacokinetic studies demonstrate that alcohol transfers into breast milk readily, with a high RID of 16% (Table 1).[9] Yet there is no accumulation of alcohol in breast milk due to alcohol's zero-order pharmacokinetic profile; the amount of alcohol in breast milk is reduced by the passage of time from alcohol consumption.[154,155] There are nomograms available for counseling that calculates, as a function of body weight and amount of alcohol consumed, the time to ''zero'' plasma levels in the lactating individual.[156]

In breastfeeding mothers, alcohol is known to decrease the production of the hormones oxytocin and prolactin, subsequently reducing the amount of breast milk available for the infant.[9,157,158] Known acute adverse infant effects include drowsiness, altered infant sleep and feeding behaviors around the time of alcohol consumption, typically with maternal blood levels of >300 mg/dL.[9,158,159] Impaired infant motor development or postnatal growth has been reported.[160] In terms of long-term effects, there are conflicting reports on child cognitive function with prospective cohort studies showing either no effect on infant development or a dose-dependent reduction in cognitive abilities at 6–7 years of age that was not sustained at 10–11 years.[150,151,161] Drinking alcohol while breastfeeding may also result in dose-dependent reductions in children's academic abilities, becoming clinically significant with riskier amounts of consumption such as frequent binge drinking.[152]

Tobacco smoking and nicotine vaping

The 2021 NSDUH found 10.1% of pregnant women reported past-month cigarette use, while some women quit during pregnancy, postpartum relapse is common where 10% of women report smoking in the postpartum period.[15,162] US data from recent reports do not include nicotine exposure from vaping products, the use of which is increasingly common, particularly among teenagers and young adults.[162] A recent study from 78 low- to middle-income countries found an overall prevalence of 3.6% for use of any tobacco product during lactation, and 2.6% for smokeless tobacco products.[163] Studies show that women who use tobacco are less likely to breastfeed,[164] but breastfeeding can be a motivation for quitting, highlighting an opportunity to engage women in smoking cessation.[165,166]

Tobacco products, including nicotine, can readily transfer into breast milk (Table 1). Nicotine has a long half-life and may remain in the breast milk for upward of 5–10 hours after cigarette use[167–169] and potentially longer after vaping.[162,170] One case report estimated nicotine RID to be 12.8%.[167] Infant nicotine exposure can also occur through second-hand smoke while breastfeeding and/or from general environmental exposures. Nicotine in breast milk diminishes with longer intervals between smoking and breastfeeding.[169,170]

Breastfeeding mothers who smoke or vape nicotine products may produce breast milk that is less nutritional,[169] produce lower volumes of breast milk, and be less likely to initiate and sustain breastfeeding.[45,171] Infant nicotine exposure can result in appetite suppression, tachycardia, and impaired sleep.[169] Infants exposed to second-hand tobacco smoke have been found to be at greater risk for ear, nose, throat, and upper respiratory infections, allergies, and sudden unexplained infant death (SUID).[168,169,171–174] Long-term health outcomes are less well understood, but tobacco exposure may increase the risk of metabolic syndrome.[175] Among infants of mothers who smoke during lactation, breastfeeding mitigates many of the health effects of second-hand smoke exposure such as SUID and respiratory illness[176–178] and is therefore recommended over commercial milk formula in the setting of maternal smoking.

Cannabis

With cannabis legalization in a growing number of countries,[179] cannabis use has increased among pregnant and breastfeeding people.[77,180] The 2021 NSDUH found that 7.2% of pregnant women in the United States report past-month cannabis use.[15] These epidemiologic trends may be in part driven by cannabis dispensaries advertising cannabis as a safe and effective treatment for nausea and vomiting during pregnancy in the absence of any safety data.[181] Additionally, both the regulated and illicit cannabis supply has become more potent. Synthetic cannabinoid products and other adulterants may be present in illicit cannabis supplies.[182] Such changes in the cannabis supply may also be impacting use patterns.

Cannabis products contain two dominant active ingredients; THC and cannabidiol.[182] The concentration of THC in human milk may exceed maternal plasma concentrations due to the high lipid content in human milk and the lipophilic nature of cannabinoids.[183–185] Cannabis RID estimates vary from 0.4% to 8.7%.[183–185] Peak cannabis concentrations in human milk usually occur within 1-hour postingestion and dissipates over time with a half-life of 17 hours and up to 6 weeks for clearance (Table 1).[184,186,187]

Maternal risks and medical recommendations of cannabis consumption during pregnancy require individualized assessment of past medical history, drug formulation, potency, duration, and route of ingestion.[188] While decreased breastfeeding duration has been observed in those who use cannabis, it is not clear if this is related to cannabis use versus other maternal social-structural factors.[189–193] Cannabis may also affect breast milk composition, decreasing immunoglobulins and increasing lactose.[194] Limited data exist describing the acute or long-term effects related to infant cannabis exposure through breast milk.[195,196] A 2020 systematic review found only two observational studies on infant outcomes each reporting conflicting results on infant motor development at 12 months.[63,197] Both studies were unable to control for prenatal cannabis exposure, thus further limiting data on cannabis exposure by breast milk alone.

OUD treatment

Pregnant and breastfeeding persons with OUD should universally be offered treatment with medications, including methadone and buprenorphine given their well-established benefits and understanding that they outweigh the risks.[198,199] Despite these recommendations and the known benefits of reducing the severity of NOWS, breastfeeding estimates among women with OUD in treatment vary widely from 17% to 81%.[64,66]

Table 2. Substance Use Disorders Treatment Pharmacokinetics

SUD treatment	*Peak effect*[a]	*Half-life*[a]	*RID (%)*
Buprenorphine (SL)	1–3 hours[237]	27–37 hours[237]	0.1–2.5[9]
Methadone	1–7.5 hours[237]	8–59 hours[237]	1.9–6.5[9]
Naltrexone	PO: 2 hours[237]	PO: 4 hours	1[9]
	IM: 2 hours (first peak), 2–3 hours (second peak)[237]	IM: 5–10 days[237]	
Acamprosate	3–8 hours[237]	20–33 hours[237]	N/A
Disulfiram	12 hours[237]	60–120 hours[237]	N/A
NRT	Transdermal: 4 hours	Transdermal: 4 hours[237]	N/A
	Gum: 0.5 hours[237]		
Varenicline	3–4 hours[237]	24 hours[237]	N/A
Bupropion	3–4 hours[237]	21 hours[237]	2.0–11[9,220]

[a]Peak and half-life values reference adult pharmacokinetic data for a potential breastfeeding individual.
IM, intramuscular; NRT, nicotine replacement therapy; PO, by mouth; RID, relative infant dose; SL, sublingual; SUD, substance use disorder.

Methadone, a full opioid agonist, is well studied in breastfeeding. Methadone concentrations in human milk are low, with a RID of 3% (Table 2). Breastfeeding should be encouraged, if desired, regardless of the methadone dose.[13,17,200] During periods of methadone titration, particularly if the dose exceeds 100 mg or is initiated postpartum, infants should be monitored for sedation and respiratory depression.[13,200–202] Long-term effects of methadone exposure through breastfeeding are poorly understood. One prospective study among 200-breastfed methadone-exposed infants found some motor delay (1.5 standard deviations) among 38% of exposed infants compared to matched controls.[203] However, given the known benefits to the parent and evidence showing breastfeeding reduces NOWS among opioid-exposed infants, we strongly recommend continuation of methadone while breastfeeding.[85,203,204]

Buprenorphine, a partial opioid agonist, has growing evidence that suggest minimal concentrations in human milk, with a RID of 0.38% (Table 2).[205] A 2016 study examining breast milk and infant plasma buprenorphine concentrations at 2, 3, 4, 14, and 30 days postdelivery among 10 buprenorphine-breastfeeding mother–infant dyads found low breast milk and infant plasma buprenorphine levels.[206] Observational data suggest there are few acute infant harms associated with buprenorphine breast milk exposure regardless of maternal dose, and breastfeeding in individuals taking buprenorphine has been found to reduce NOWS severity.[207–211] Long-term infant safety data remains lacking. In general, breastfeeding should be encouraged for women taking buprenorphine.[212] Newer monthly injectable buprenorphine formulations have not yet been studied with lactation. There are concerns about a preservative contained in the injection called N-methyl-2-pyrrolidone that may be toxic, but concentrations in breast milk are unknown.[212]

For individuals interested in providing breast milk who are stable in recovery and doing well on these medications, decisions around changing medications should be made in consultation with an addiction expert given the risks associated with changes to treatment. Like other opioids, both methadone and buprenorphine may increase prolactin, but an impact on breastfeeding has not been shown.

Naltrexone, an opioid antagonist, has limited safety data during lactation. Naltrexone is available in several formulations (oral tablet, extended-release monthly injection, and multiyear implantable device). A single case study from an individual on a stable daily oral dose of 50 mg of naltrexone assessed postpartum maternal serum and breast milk samples and infant serum samples.[213] The calculated 24-hour infant dose was low, indicating low infant exposure. Developmental assessments of the infant at 6 weeks were normal.[213] Though data are limited, given the minimal transmission of naltrexone and its metabolite into breast milk, breastfeeding is recommended.

Alcohol use disorder treatment

There are three medications commonly used to treat alcohol use disorder (AUD): acamprosate, naltrexone (discussed above under OUD treatments), and disulfiram (Table 2). For non-breastfeeding individuals, the American Psychiatric Association (APA) recommends acamprosate or naltrexone as first-line treatment for moderate-to-severe AUD, with disulfiram considered second-line therapy under close supervision.[214,215] Given there is no amount of alcohol that is considered safe during pregnancy, use of pharmacotherapy for AUD during the pregnancy can decrease the risk for Fetal Alcohol Spectrum Disorders which have significant implications for child health.[216]

There are no data available on the transfer of acamprosate into breast milk or RID. Due to its low molecular weight and lack of protein binding, it is possible that it could readily enter breast milk; however, it has low oral absorption.[9] Disulfiram is used less frequently to treat AUD and works by inhibiting aldehyde dehydrogenase (ADH), one of the enzymes responsible for the metabolism of alcohol.[9] There is no data on the transfer of disulfiram into breast milk or RID; however, it is thought that it may be transferred into milk due to its small molecular weight. It is possible that any quantity in the milk could produce long-lasting inhibition of the infant's ADH.[9] Any ingestion of alcohol while taking disulfiram causes alcohol toxicity; thus, if the breastfeeding mother were to use any alcohol at the same time as disulfiram, it could potentially cause toxicity in the infant.

There is insufficient data to make a recommendation for acamprosate or disulfiram; however, given the pharmacokinetics and demonstrated benefits of acamprosate in individuals with AUD, this is likely safer than disulfiram during breastfeeding.

Tobacco smoking cessation treatment

Individuals who continue to smoke tobacco while breastfeeding should be offered pharmacotherapy treatments to assist with cessation given the clear risks of smoking to the

mother–infant dyad. Among nonbreastfeeding individuals, the most effective smoking cessation strategy is a combination of nicotine replacement therapy (NRT, nicotine patches, gum, etc.) and medication (varenicline or bupropion) treatments.[217,218] However, minimal pharmacotherapy safety data complicate approaches during breastfeeding. In general smoking cessation, products are preferable to continued smoking during breastfeeding and shared decision-making should be pursued to guide treatment.

Nicotine replacement products are the best studied, and the benefits outweigh the risks of ongoing cigarette smoking. However, though parental nicotine serum levels from NRT are lower than levels while smoking or vaping,[169] nicotine can still transfer to breast milk and may be associated with the same acute infant harms described above (Table 2).[219,220] NRT is available in short- and long-acting formulations including gum, lozenges, nasal spray, oral inhaler, and patches. NRT can be pursued while breastfeeding and the type of NRT used should be determined by the clinical needs of the breastfeeding mother.

Varenicline, a partial nicotine agonist, is the most effective treatment for smoking cessation, but there is no safety data available for its use during breastfeeding. Animal data suggest that varenicline may interfere with normal infant lung development.[219] According to the manufacturer, varenicline's pharmacokinetics (small molecular weight, low protein-binding, and long half-life) suggest that it may transfer readily into human milk, and breastfed infants should be monitored for seizures and excessive vomiting.[221] However, there is no data on how commonly these adverse events occur. The decision to use varenicline should be pursued in partnership with the patient based on the severity of tobacco use disorder and the clinical context.

Bupropion, an aminoketone antidepressant, has some nicotine receptor-blocking activity and the sustained-release formation is an effective smoking cessation treatment.[222] Two prospective studies among women examined bupropion and its metabolite concentrations in breast milk and found the RID to range from 2% to 11% (Table 2).[220,223] Data on infant exposure harms are mixed with some studies finding no adverse effects while others found seizure-like events.[220] However, the latter reports were among three infants aged 6–6.5 months who were only partially breastfed, so the link is unclear. A randomized controlled trial assessing bupropion for smoking cessation among postpartum women is underway that will provide more specific insights into its harms and benefits.[224] Bupropion can be used for smoking cessation treatment among breastfeeding women.

Vaping or electronic nicotine delivery systems are used as a harm reduction smoking cessation approach in nonlactating individuals in contexts where first-line treatments have not helped or in settings where patients remain precontemplative.[225,226] No safety data exist in breastfeeding. Vapors from devices and nicotine compounds contain potentially toxic and carcinogenic substances like tobacco, but at lower levels. Given the lack of data, we would recommend pursuing first-line smoking cessation treatments in breastfeeding mothers.

Recommendations

For each recommendation, the quality of evidence (LOE 1, 2, and 3) and the SOR (A, B, and C) are noted as defined by the SORT criteria.[5,6]

General breastfeeding recommendations in the setting of maternal substance use

Breastfeeding decisions among substance-exposed mother–infant dyads are complex, but below are some general recommendations that facilitate breastfeeding[227,228] and minimize inconsistencies and biases[64] in decision-making (Table 3). Based on the evidence, individuals who discontinue nonprescribed substance use by the delivery hospitalization can be supported in breastfeeding initiation[62,64] with appropriate follow-up such as postpartum SUD care and lactation support.[229–231]

1. *Multidisciplinary care: Those who have SUD or use substances during pregnancy or the postpartum period should engage in multidisciplinary prenatal and postpartum substance use care.*
   Level of Evidence: 2. Strength of Recommendation: B.
2. *Breastfeeding initiation timing: Individuals who discontinue nonprescribed substance use by the delivery hospitalization can be supported in breastfeeding initiation.*
   Level of Evidence: 2. Strength of Recommendation: B.
3. *Perinatal breastfeeding support: Targeted perinatal dyadic breastfeeding care such as prenatal education, inpatient and postpartum lactation support, and ongoing multidisciplinary SUD treatment can facilitate breastfeeding continuation.*
   Level of Evidence: 2. Strength of Recommendation: B.

Table 3. General Recommendations for Breastfeeding Among Individuals Who Use Substances or with Substance Use Disorders

Recommendation	*Level of evidence*	*Strength of recommendation*
Those who have SUD or use substances during pregnancy or the postpartum period should engage in multidisciplinary prenatal and postpartum substance use care.	2	B
Individuals who discontinue nonprescribed substance use by the delivery hospitalization can be supported in breastfeeding initiation with appropriate follow-up.	2	B
Targeted perinatal dyadic lactation care such as prenatal education, inpatient and postpartum lactation support, and ongoing multidisciplinary SUD treatment can facilitate breastfeeding continuation.	2	B
Individual programs and institutions should establish breastfeeding guidelines to mitigate bias, facilitate consistency across providers, and empower individuals with SUD.	3	C

Table 4. Summary of Breastfeeding Recommendations for Nonprescribed Substance Use

Recommendations	*Infant monitoring/potential harms*	*Maternal monitoring/potential harms*	*Additional considerations*
Opioids Breastfeeding should be avoided during the use of nonprescribed opioids. *Level of Evidence: 2* *Strength of Recommendation: B*	Sedation, respiratory depression, withdrawal, and associated feeding difficulties	Sedation, decreased responsiveness to infant, rare reports of delayed lactogenesis	Pumping/expressing milk should be recommended in cases of recent use if future abstinence is supported. Consider a relapse plan and other supportive measures.
Sedative hypnotics Breastfeeding should be avoided during the use of nonprescribed sedative-hypnotics *Level of Evidence: 3* *Strength of Recommendation: C*	Sedation, respiratory depression, withdrawal, inadequate weight gain	Sedation, decreased responsiveness to infant	Individuals prescribed benzodiazepines for the treatment of benzodiazepine use disorder or for anxiety disorders may safely breastfeed.
Stimulants Breastfeeding should be avoided during the use of nonprescribed stimulants. *Level of Evidence: 3* *Strength of Recommendation: B*	Gastrointestinal and cardiorespiratory symptoms, hypothermia, irritability, tremors, sleep disturbance, and seizures	Reduced breast milk production	May accumulate in greater quantities in breast milk than maternal serum. Individuals prescribed stimulants for the treatment of ADHD may safely breastfeed.
Alcohol Breastfeeding should be avoided after moderate-to-high alcohol consumption. Occasional intake of more modest amounts of alcohol during lactation and waiting 2 hours per drink consumed to resume breastfeeding is likely safe. *Level of Evidence: 1* *Strength of Recommendation: A*	Drowsiness, changes in sleep and eating behaviors, possible impact on long-term neurodevelopment	Decreased breast milk production	There is no accumulation of alcohol in breast milk due to alcohol's zero-order pharmacokinetic profile.
Nicotine Breastfeeding is recommended, but individuals should be counseled and supported to reduce or stop the use of nicotine products while breastfeeding. *Level of Evidence: 1* *Strength of Recommendation: A*	Altered feeding and sleep	Breast milk is less nutritional, decreased milk production	Second-hand smoke exposure is associated with an increased risk for upper respiratory infections, allergies, and SUID in the infants. Little data are available for vaping products.
Cannabis We encourage cessation and/or reduction of cannabis use during lactation. *Level of Evidence: 2* *Strength of Recommendation: B*	Possible neurodevelopmental effects	Changes in breast milk composition and decrease in duration of breastfeeding	For individuals who continue to use cannabis and wish to breastfeed, we recommend a shared decision-making process to discuss the risks and benefits.

ADHD, attention deficit hyperactivity disorder; SUID, sudden unexpected infant death.

4. *Establish consistent approaches: Individual programs and institutions should establish breastfeeding guidelines to mitigate bias, facilitate consistency across providers, and empower individuals with SUD.*
   Level of Evidence: 3. Strength of Recommendation: C.

Breastfeeding recommendations in the setting of nonprescribed substance use

Recommendations by nonprescribed substance are summarized below and in Table 4. For all people using nonprescribed substances interested in breastfeeding, we recommend that clinicians encourage use reduction and/or detoxification and cessation where possible, with connection to appropriate treatments and supports. Among those who stop nonprescribed substance use but have a return to use, breastfeeding can be resumed after clearance of the substance with supportive treatment plans in place.[232,233]

1. *Opioids: Breastfeeding should be avoided during the use of nonprescribed opioids.*
   Level of Evidence: 2. Strength of Recommendation: B.
2. *Sedative hypnotics: Breastfeeding should be avoided during the use of nonprescribed sedative hypnotics.*
   Level of Evidence: 3. Strength of Recommendation: C.
3. *Prescribed benzodiazepines: In breastfeeding mothers who stop nonprescribed use but remain on prescribed benzodiazepine tapers for the treatment of benzodiazepine use disorder, or for anxiety disorders, mothers may return to breastfeeding.*
   Level of Evidence: 2. Strength of Recommendation: B.
4. *Stimulants: Breastfeeding should be avoided during the use of nonprescribed stimulants.*
   Level of Evidence: 3. Strength of Recommendation: B.
5. *Alcohol: Breastfeeding should be avoided immediately after moderate-to-high alcohol consumption. Occasional intake of modest amounts of alcohol (two 150 mL glasses of wine or 1.5 pints of beer) during lactation and waiting for 2 hours per drink consumed to resume breastfeeding is likely safe.*
   Level of Evidence: 1. Strength of Recommendation: A.
6. *Combustible tobacco and nicotine vaping: We recommend breastfeeding to be continued in those mothers who smoke or vape, given the documented benefits, but suggest they reduce their use as much as possible and avoid tobacco smoking and nicotine vaping product use around their infants.*
   Level of Evidence: 1. Strength of Recommendation: A.
7. *Cannabis: We encourage cessation and/or reduction of cannabis use during breastfeeding.*[234–236]
   Level of Evidence: 2. Strength of Recommendation: B.
8. *For mothers who continue to use cannabis and wish to breastfeed, we recommend a shared decision-making process to discuss the risks and benefits of breastfeeding. Discussions may be guided by examining the route and type of cannabis product use, potency of product use, and frequency of use.*
   Level of Evidence: 3. Strength of Recommendation: C.

Breastfeeding recommendations in the setting of substance use treatment

Recommendations for SUD treatment are summarized below and in Table 5. In general, SUD treatments should be supported through informed risk–benefit discussions with patients with the caveat that any fetal and/or neonatal risks must be considered in the context of ongoing nonprescribed use that may occur in the absence of evidence-based treatment.

1. *Methadone: Breastfeeding is compatible with methadone treatment, regardless of dose, and recommended in mothers taking methadone. During periods of titration, breastfeeding mothers should be counselled to monitor for infant sedation.*
   Level of Evidence: 2. Strength of Recommendation: A.
2. *Buprenorphine sublingual: Breastfeeding is compatible with sublingual-buprenorphine formulations and is recommended in mothers taking sublingual-buprenorphine.*
   Level of Evidence: 2. Strength of Recommendation: A.
3. *Buprenorphine injectable: Safety data for injectable extended-release buprenorphine formulations are lacking. Decisions around and treatment changes to support breastfeeding should be made in consultation with the patient and addiction provider given the risks associated with changes in OUD treatment.*
   Level of Evidence: 3. Strength of Recommendation: C.
4. *Naltrexone: Breastfeeding is compatible with naltrexone and is recommended in mothers taking naltrexone.*
   Level of Evidence: 3. Strength of Recommendations: B.
5. *Acamprosate: Breastfeeding appears compatible with acamprosate, but there is little evidence; thus, providers should pursue a risk–benefit discussion with patients to guide decision-making.*
   Level of Evidence: 3. Strength of Recommendation: C.

Table 5. Summary of Breastfeeding Recommendations for Substance Use Disorder Treatments

SUD treatment	*Recommendations*	*Level of evidence*	*Strength of recommendation*
Methadone	Compatible with breastfeeding, regardless of dose.	2	A
Buprenorphine (SL)	Compatible with breastfeeding, regardless of dose.	2	A
Naltrexone	Compatible with breastfeeding.	3	B
Acamprosate	Likely compatible with breastfeeding.	3	C
Disulfiram	Not recommended given potential toxicity.	3	C
NRT	Compatible with breastfeeding	2	B
Varenicline	Use cautiously with a shared decision-making approach.	3	C
Bupropion	Compatible with breastfeeding.	2	B

NRT, nicotine replacement therapy; SL, sublingual.

6. *Disulfiram: Breastfeeding does not appear compatible with disulfiram given risk of infant exposure and risk of alcohol toxicity in the breastfeeding mother. Thus, other AUD treatments should be pursued over disulfiram in the setting of breastfeeding.*
   Level of Evidence: 3. Strength of Recommendation: C.
7. NRT*: Breastfeeding is compatible with NRT and is recommended in mothers taking NRT. The type of NRT should be determined by the clinical needs of the breastfeeding mother.*
   Level of Evidence: 2. Strength of Recommendation: B.
8. *Varenicline: Animal data suggest there may be some harms associated with varenicline exposure through breast milk, though clinical data are lacking. Providers should pursue a risk–benefit discussion with patients to guide decision-making based on the severity of tobacco use disorder and the clinical context.*
   Level of Evidence: 3. Strength of Recommendation: C.
9. *Bupropion: Breastfeeding is compatible with bupropion, and bupropion is recommended in the setting of breastfeeding.*
   Level of Evidence: 2. Strength of Recommendation: B.

Summary

Breastfeeding guidance among individuals who use substances and those with SUD is complex and should be pursued in partnership with the patient and a multidisciplinary team. The creation of recommendations is complicated by an overall limited body of available evidence. Additionally, many individuals with SUD use multiple substances, such as opioids and stimulants, which have different risks and treatments, complicating breastfeeding decision-making. Further, there are frequently newly emerging nonprescribed substances and novel treatments, as well as regional variations in both, that challenge evidenced-based guidance. In summary, patient-centered approaches that review individualized risks and benefits are key to breastfeeding decision-making among individuals who use substances or with SUD.

Recommendations for Future Research

The following areas of research are suggested to enhance future evidence for breastfeeding guidance in substance-exposed mother–infant dyads:

1. Further studies on the pharmacokinetics and safety of opioids, including long-term lactation data and studies of newer medications used to treat OUD such as extended-release buprenorphine formulations.
2. Investigation of the pharmacokinetics and safety of medications used for the treatment of AUD and nicotine use disorder including naltrexone, acamprosate, and nicotine replacement treatments.
3. Investigation of the pharmacokinetics and safety of breastfeeding in the setting of nonprescribed sedative-hypnotics and stimulant use.
4. Additional studies of infant safety and outcomes after exposure to various amounts of cannabis via the breast milk.
5. In vitro studies using human breast milk samples to better understand the properties of nonprescribed substances such as cocaine and methamphetamines in a breast milk medium.
6. Studies examining breast milk exposure in the setting of polysubstance use to determine any differences in pharmacokinetics and infant adverse effects.
7. Appropriately powered and designed studies that examine the long-term outcomes of infants exposed to nonprescribed substances via breast milk.
8. Investigation of the effect of breastfeeding on SUD outcomes and exploration of the possible biochemical and behavioral mechanisms by which breastfeeding may impact recovery.
9. Developing and testing of interventions to support breastfeeding dyads with maternal SUD.
10. Development of point of care tests to assess exposures in breast milk.

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Authors' Contributions

The authors have all contributed to the conception and drafting of this document.

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References

1. Hernández-Aguilar M-T, Bartick M, Schreck P, et al. ABM clinical protocol #7: Model maternity policy supportive of breastfeeding. Breastfeed Med 2018;13(9):559–574; doi: 10.1089/bfm.2018.29110.mha
2. Reece-Stremtan S, Campos M, Kokajko L. ABM clinical protocol #15: Analgesia and anesthesia for the breastfeeding mother, revised 2017. Breastfeed Med 2017; 12(9):500–506.
3. Sriraman NK, Melvin K, Meltzer-Brody S, et al. ABM clinical protocol #18: Use of antidepressants in breastfeeding mothers. Breastfeed Med 2015;10(6):290–299; doi: 10.1089/bfm.2015.29002
4. Reece-Stremtan S, Marinelli KA. ABM clinical protocol #21: Guidelines for breastfeeding and substance use or

substance use disorder, revised 2015. Breastfeed Med 2015;10(3):135–141; doi: 10.1089/bfm.2015.9992
5. Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): A patient-centered approach to grading evidence in the medical literature. Am Fam Physician 2004;69(3):548–56.
6. Feldman-Winter L, Bartick M, Marinelli K, et al. Academy of breastfeeding medicine recommendations on changes to classification of levels of evidence for clinical protocols. Breastfeed Med 2021;16(3):185–188; doi: 10.1089/bfm.2020.0272
7. Verstegen RHJ, Ito S. Drugs in lactation. J Obstet Gynaecol Res 2019;45(3):522–531; doi: 10.1111/jog.13899
8. Anderson PO, Sauberan JB. Modeling drug passage into human milk. Clin Pharmacol Ther 2016;100(1):42–52; doi: 10.1002/cpt.377
9. Hale TW, Krutsch K. Hale's Medications & Mothers' Milk 2023: A Manual of Lactational Pharmacology. Springer Publishing Company: New York; 2022.
10. Cicero T, Ellis M, Surratt H, et al. The changing face of heroin use in the United States: A retrospective analysis of the past 50 years. JAMA Psychiatry 2014;71(7):821–826.
11. Han B, Cotto J, Etz K, et al. Methamphetamine overdose deaths in the US by sex and race and ethnicity. JAMA Psychiatry 2021;78(5):564–567; doi: 10.1001/jamapsychiatry.2020.4321
12. Keyes KM, Grant BF, Hasin DS. Evidence for a closing gender gap in alcohol use, abuse, and dependence in the United States population. Drug Alcohol Depend 2008;93(1–2):21–29; doi: 10.1016/j.drugalcdep.2007.08.017
13. Ito S. Opioids in breast milk: pharmacokinetic principles and clinical implications. J Clin Pharmacol 2018;58:S151–S163; doi: 10.1002/jcph.1113
14. Degenhardt L, Charlson F, Ferrari A, et al. The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. Lancet Psychiatry 2018;5(12):987–1012; doi: 10.1016/S2215-0366(18)30337-7
15. Substance Use and Mental Health Services Administration. Key Substance Use and Mental Health Indicators in the United States: Results from the 2021 National Survey on Drug Use and Health. Substance Use and Mental Health Services Administration; Rockville, MD, USA; 2023.
16. Victora CG, Bahl R, Barros AJD, et al. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. Lancet 2016;387(10017):475–490; doi: 10.1016/S0140-6736(15)01024-7
17. Welle-Strand GK, Skurtveit S, Jansson LM, et al. Breastfeeding reduces the need for withdrawal treatment in opioid-exposed infants. Acta Paediatr Oslo Nor 1992 2013;102(11):1060–1066; doi: 10.1111/apa.12378
18. Abdel-Latif ME, Pinner J, Clews S, et al. Effects of breast milk on the severity and outcome of neonatal abstinence syndrome among infants of drug-dependent mothers. Pediatrics 2006;117(6):e1163–e1169; doi: 10.1542/peds.2005-1561
19. Chapman SLC, Wu L-T. Postpartum substance use and depressive symptoms: A review. Women Health 2013;53(5):479–503; doi: 10.1080/03630242.2013.804025
20. Rutherford H, Williams S, Moy S, et al. Disruption of maternal parenting circuitry by addictive process: Rewiring of reward and stress systems. Front Psychiatry 2011;2:37.
21. D'Apolito K. Breastfeeding and substance abuse. Clin Obstet Gynecol 2013;56(1):202–211; doi: 10.1097/GRF.0b013e31827e6b71
22. Lotzin A, Grundmann J, Hiller P, et al. Profiles of childhood trauma in women with substance use disorders and comorbid posttraumatic stress disorders. Front Psychiatry 2019;10:674; doi: 10.3389/fpsyt.2019.00674
23. Choi S, Rosenbloom D, Stein MD, et al. Differential gateways, facilitators, and barriers to substance use disorder treatment for pregnant women and mothers: A scoping systematic review. J Addict Med 2022;16(3):e185–e196; doi: 10.1097/ADM.0000000000000909
24. Harris MTH, Laks J, Stahl N, et al. Gender dynamics in substance use and treatment: A women's focused approach. Med Clin North Am 2022;106(1):219–234; doi: 10.1016/j.mcna.2021.08.007
25. Vythilingum B, Roos A, Faure SC, et al. Risk factors for substance use in pregnant women in South Africa. S Afr Med J 2012;102(11):851; doi: 10.7196/SAMJ.5019
26. Stulac S, Bair-Merritt M, Wachman EM, et al. Children and families of the opioid epidemic: Under the radar. Curr Probl Pediatr Adolesc Health Care 2019;49(8):100637; doi: 10.1016/j.cppeds.2019.07.002
27. Marshall SK, Charles G, Hare J, et al. Sheway's services for substance using pregnant and parenting women: Evaluating the outcomes for infants. Can J Community Ment Health Rev Can Sante Ment Communaut 2005;24(1):19–34; doi: 10.7870/cjcmh-2005-0002
28. Ganetsky VS, Heil J, Yates B, et al. A low-threshold comprehensive shared medical appointment program for perinatal substance use in an underserved population. J Addict Med 2022;16(3):e203–e209; doi: 10.1097/ADM.0000000000000912
29. Schiff DM, Partridge S, Gummadi NH, et al. Caring for families impacted by opioid use: A qualitative analysis of integrated program designs. Acad Pediatr 2022;22(1):125–136; doi: 10.1016/j.acap.2021.04.016
30. Guttmacher Institute. Substance Use During Pregnancy. Guttmacher Institute: New York, NY, USA; 2021.
31. Murphy AS. A survey of state fetal homicide laws and their potential applicability to pregnant women who harm their own fetuses. Ind LJ 2014;89:847.
32. Boyd S. Gendered drug policy: Motherisk and the regulation of mothering in Canada. Int J Drug Policy 2019;68:109–116; doi: 10.1016/j.drugpo.2018.10.007
33. Oni HT, Drake JA, Dietze P, et al. Barriers to women's disclosure of and treatment for substance use during pregnancy: A qualitative study. Women Birth J Aust Coll Midwives 2022;35(6):576–581; doi: 10.1016/j.wombi.2021.12.009
34. Kozhimannil KB, Dowd WN, Ali MM, et al. Substance use disorder treatment admissions and state-level prenatal substance use policies: Evidence from a national treatment database. Addict Behav 2019;90:272–277; doi: 10.1016/j.addbeh.2018.11.019
35. Hui K, Angelotta C, Fisher CE. Criminalizing substance use in pregnancy: Misplaced priorities. Addict Abingdon Engl 2017;112(7):1123–1125.
36. Chen C-Y, Wang I-A, Fang S-Y, et al. Inadequate prenatal care utilization among women with and without methadone-treated opioid use disorders in Taiwan. Int J

Drug Policy 2019;67:1–8; doi: 10.1016/j.drugpo.2019.01.024
37. Slabbert I, Greene MC, Womersley JS, et al. Article commentary: Women and substance use disorders in low- and middle-income countries: A call for advancing research equity in prevention and treatment. Subst Abuse 2020;41(1):6–10; doi: 10.1080/08897077.2019.1680481
38. Harp KLH, Bunting AM. The racialized nature of child welfare policies and the social control of black bodies. Soc Polit 2020;27(2):258–281; doi: 10.1093/sp/jxz039
39. Pflugeisen BM, Mou J, Drennan KJ, et al. Demographic discrepancies in prenatal urine drug screening in Washington State surrounding recreational marijuana legalization and accessibility. Matern Child Health J 2020; 24(12):1505–1514; doi: 10.1007/s10995-020-03010-5
40. Schiff DM, Nielsen T, Hoeppner BB, et al. Assessment of racial and ethnic disparities in the use of medication to treat opioid use disorder among pregnant women in Massachusetts. JAMA Netw Open 2020;3(5):e205734; doi: 10.1001/jamanetworkopen.2020.5734
41. Perlman NC, Cantonwine DE, Smith NA. Racial differences in indications for obstetrical toxicology testing and relationship of indications to test results. Am J Obstet Gynecol MFM 2021;4(1):100453; doi: 10.1016/j.ajogmf.2021.100453
42. Cedar Project Partnership, Clarkson AF, Christian WM, et al. The Cedar Project: Negative health outcomes associated with involvement in the child welfare system among young Indigenous people who use injection and non-injection drugs in two Canadian cities. Can J Public Health Rev Can Sante Publique 2015;106(5):e265–e270; doi: 10.17269/cjph.106.5026
43. Mitchell-Foster SM, Emon CE, Brouwer M, et al. Disconnected perspectives: Patient and care provider's experiences of substance use in pregnancy. Int J Gynaecol Obstet Off Organ Int Fed Gynaecol Obstet 2021;155(2): 170–178; doi: 10.1002/ijgo.13919
44. Burns L, Mattick RP, Lim K, et al. Methadone in pregnancy: Treatment retention and neonatal outcomes. Addict Abingdon Engl 2007;102(2):264–270; doi: 10.1111/j.1360-0443.2006.01651.x
45. Nidey N, Groh K, Agnoli A, et al. Breastfeeding initiation and continuation among women with substance and tobacco use during pregnancy: Findings from the pregnancy risk assessment monitoring system 2016–2018. Breastfeed Med Off J Acad Breastfeed Med 2022;17(6):544–549; doi: 10.1089/bfm.2021.0337
46. Stephen JM, Shrestha S, Jimenez EY, et al. Disparities in breastfeeding outcomes among women with opioid use disorder. Acta Paediatr Oslo Nor 1992 2020;109(5):1064–1066; doi: 10.1111/apa.15107
47. Rangmar J, Lilja M, Köhler M, et al. Children who face development risks due to maternal addiction during pregnancy require extra medical and psychosocial resources. Acta Paediatr 2019;108(1):101–105; doi: 10.1111/apa.14407
48. Arnaudo CL, Andraka-Christou B, Allgood K. Psychiatric co-morbidities in pregnant women with opioid use disorders: Prevalence, impact, and implications for treatment. Curr Addict Rep 2017;4(1):1–13; doi: 10.1007/s40429-017-0132-4
49. Cottler LB, Nishith P, Compton WM. Gender differences in risk factors for trauma exposure and post-traumatic stress disorder among inner-city drug abusers in and out of treatment. Compr Psychiatry 2001;42(2):111–117; doi: 10.1053/comp.2001.21219
50. Demirci JR, Bogen DL, Klionsky Y. Breastfeeding and methadone therapy: The maternal experience. Subst Abuse 2015;36(2):203–208; doi: 10.1080/08897077.2014.902417
51. Jansson LM, Velez ML, Butz AM. The effect of sexual abuse and prenatal substance use on successful breastfeeding. J Obstet Gynecol Neonatal Nurs 2017;46(3):480–484; doi: 10.1016/j.jogn.2017.02.002
52. Yonke N, Jimenez EY, Leeman L, et al. Breastfeeding motivators and barriers in women receiving medications for opioid use disorder. Breastfeed Med 2020;15(1):17–23; doi: 10.1089/bfm.2019.0122
53. Howard MB, Wachman E, Levesque EM, et al. The joys and frustrations of breastfeeding and rooming-in among mothers with opioid use disorder: A qualitative study. Hosp Pediatr 2018;8(12):761–768; doi: 10.1542/hpeds.2018-0116
54. Hicks J, Morse E, Wyant DK. Barriers and facilitators of breastfeeding reported by postpartum women in methadone maintenance therapy. Breastfeed Med 2018;13(4): 259–265; doi: 10.1089/bfm.2017.0130
55. Cook KJ, Larson KL. Breastworks: Breastfeeding practices among women with substance use disorder. Appl Nurs Res ANR 2019;47:41–45; doi: 10.1016/j.apnr.2019.04.006
56. Jansson LM, Velez M, Harrow C. Methadone maintenance and lactation: A review of the literature and current management guidelines. J Hum Lact 2004;20(1):62–71; doi: 10.1177/0890334403261027
57. World Health Organization. Guidelines for the Identification and Management of Substance Use and Substance Use Disorders in Pregnancy. World Health Organization: Geneva; 2014.
58. American College of Obstetricians and Gynecologists Committee on Health Care for Undeserved Women. ACOG Committee opinion no. 343: Psychosocial risk factors: Perinatal screening and intervention. Obstet Gynecol 2006;108(2):469–477; doi: 10.1097/00006250-200608000-00046
59. Wanar A, Saia K, Field TA. Delayed norfentanyl clearance during pregnancy. Obstet Gynecol 2020;136(5):905–907; doi: 10.1097/AOG.0000000000004106
60. Sazegar P. Cannabis essentials: Tools for clinical practice. Am Fam Physician 2021;104(6):598–608.
61. Moeller KE, Kissack JC, Atayee RS, et al. Clinical interpretation of urine drug tests: What clinicians need to know about urine drug screens. Mayo Clin Proc 2017; 92(5):774–796; doi: 10.1016/j.mayocp.2016.12.007
62. Harris M, Joseph K, Hoeppner B, et al. A retrospective cohort study examining the utility of perinatal urine toxicology testing to guide breastfeeding initiation. J Addict Med 2021;15(4):311–317; doi: 10.1097/ADM.0000000000000761
63. Ordean A, Kim G. Cannabis use during lactation: Literature review and clinical recommendations. J Obstet Gynaecol Can 2020;42(10):1248–1253; doi: 10.1016/j.jogc.2019.11.003
64. Wachman EM, Saia K, Humphreys R, et al. Revision of breastfeeding guidelines in the setting of maternal opioid use disorder: One institution's experience. J Hum Lact 2016;32(2):382–387; doi: 10.1177/0890334415613823

65. Blandthorn J, James K, Bowman E, et al. Two case studies illustrating a shared decision-making approach to illicit methamphetamine use and breastfeeding. Breastfeed Med 2017;12(6):381–385; doi: 10.1089/bfm.2017.0010
66. Tsai LC, Doan TJ. Breastfeeding among mothers on opioid maintenance treatment: A literature review. J Hum Lact 2016;32(3):521–529; doi: 10.1177/0890334416641909
67. Doerzbacher M, Chang YP. Supporting breastfeeding for women on opioid maintenance therapy: A systematic review. J Perinatol 2019;39(9):1159–1164; doi: 10.1038/s41372-019-0411-0
68. Crook K, Brandon D. Prenatal breastfeeding education: Impact on infants with neonatal abstinence syndrome. Adv Neonatal Care 2017;17(4):299–305; doi: 10.1097/anc.0000000000000392
69. Schiff DM, Wachman EM, Philipp B, et al. Examination of hospital, maternal, and infant characteristics associated with breastfeeding initiation and continuation among opioid-exposed mother-infant dyads. Breastfeed Med 2018;13(4):266–274; doi: 10.1089/bfm.2017.0172
70. Shukla S, Hanna I, Cortez J, et al. Increasing usage of mother's own milk in neonates at risk of neonatal abstinence syndrome: MOM-NAS quality improvement initiative. J Perinatol 2021;41(11):2684–2689; doi: 10.1038/s41372-021-01209-0
71. MacMillan KDL, Rendon CP, Verma K, et al. Association of rooming-in with outcomes for neonatal abstinence syndrome: A systematic review and meta-analysis. JAMA Pediatr 2018;172(4):345; doi: 10.1001/jamapediatrics.2017.5195
72. Moore ER, Anderson GC, Bergman N, et al. Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database Syst Rev 2012;5:CD003519; doi: 10.1002/14651858.CD003519.pub3
73. Haight SC, Ko JY, Tong VT, et al. Opioid use disorder documented at delivery hospitalization—United States, 1999–2014. MMWR Morb Mortal Wkly Rep 2018;67(31):845–849; doi: 10.15585/mmwr.mm6731a1
74. Ko JY, Patrick SW, Tong VT, et al. Incidence of neonatal abstinence syndrome—28 States, 1999–2013. MMWR Morb Mortal Wkly Rep 2016;65(31):799–802; doi: 10.15585/mmwr.mm6531a2
75. Patrick SW, Barfield WD, Poindexter BB. Neonatal opioid withdrawal syndrome. Pediatrics 2020;146(5):e2020029074; doi: 10.1542/peds.2020-029074
76. Turner SD, Gomes T, Camacho X, et al. Neonatal opioid withdrawal and antenatal opioid prescribing. CMAJ Open 2015;3(1):E55–E61; doi: 10.9778/cmajo.20140065
77. Substance Abuse Mental Health Services Administration. Key Substance Use and Mental Health Indicators in the United States: Results from the 2019 National Survey on Drug Use and Health. Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration: Rockville, MD; 2020.
78. Ciccarone D. Fentanyl in the US heroin supply: A rapidly changing risk environment. Int J Drug Policy 2017;46:107–111; doi: 10.1016/j.drugpo.2017.06.010
79. Lewis B, Hoffman LA, Nixon SJ. Sex differences in drug use among polysubstance users. Drug Alcohol Depend 2014;145:127–133; doi: 10.1016/j.drugalcdep.2014.10.003
80. Ciccarone D. The rise of illicit fentanyls, stimulants and the fourth wave of the opioid overdose crisis. Curr Opin Psychiatry 2021;34(4):344–350.
81. DiGennaro C, Garcia G-GP, Stringfellow EJ, et al. Changes in characteristics of drug overdose death trends during the COVID-19 pandemic. Int J Drug Policy 2021;98:103392; doi: 10.1016/j.drugpo.2021.103392
82. Frank RG, Pollack HA. Addressing the fentanyl threat to public health. N Engl J Med 2017;376(7):605–607; doi: 10.1056/NEJMp1615145
83. Gladden RM, Martinez P, Seth P. Fentanyl law enforcement submissions and increases in synthetic opioid–involved overdose deaths—27 states, 2013–2014. MMWR Morb Mortal Wkly Rep; 2016;65(33);837–843.
84. Laing MK, Tupper KW, Fairbairn N. Drug checking as a potential strategic overdose response in the fentanyl era. Int J Drug Policy 2018;62:59–66; doi: 10.1016/j.drugpo.2018.10.001
85. Bogen DL, Whalen BL. Breastmilk feeding for mothers and infants with opioid exposure: What is best? Semin Fetal Neonatal Med 2019;24(2):95–104; doi: 10.1016/j.siny.2019.01.001
86. Hendrickson RG, McKeown NJ. Is maternal opioid use hazardous to breast-fed infants? Clin Toxicol 2012;50(1):1–14.
87. Bruneau J, Ahamad K, Goyer M-È, et al. Management of opioid use disorders: A national clinical practice guideline. CMAJ 2018;190(9):E247–E257.
88. Krčevski Škvarč N, Morlion B, Vowles KE, et al. European clinical practice recommendations on opioids for chronic noncancer pain—Part 2: Special situations*. Eur J Pain U K 2021;25(5):969–985; doi: 10.1002/ejp.1744
89. Drugs and Lactation Database (LactMed). Heroin. National Institutes of Health: Bethesda (MD); 2021.
90. Lee AI, McCarthy RJ, Toledo P, et al. Epidural labor analgesia-fentanyl dose and breastfeeding success: A randomized clinical trial. Anesthesiology 2017;127(4):614–624; doi: 10.1097/ALN.0000000000001793
91. Goma HM, Said RN, El-Ela AM. Study of the newborn feeding behaviors and fentanyl concentration in colostrum after an analgesic dose of epidural and intravenous fentanyl in cesarean section. Saudi Med J 2008;29(5):678–682.
92. Yousefshahi F, Davari-Tanha F, Najafi A, et al. Effects of intrathecal opioids use in cesarean section on breastfeeding and newborns' weight gaining. J Fam Reprod Health 2016;10(4):176–183.
93. Fleet J-A, Jones M, Belan I. The influence of intrapartum opioid use on breastfeeding experience at 6 weeks postpartum: A secondary analysis. Midwifery 2017;50:106–109; doi: 10.1016/j.midw.2017.03.024
94. Wilson MJA, MacArthur C, Cooper GM, et al. Epidural analgesia and breastfeeding: A randomised controlled trial of epidural techniques with and without fentanyl and a non-epidural comparison group. Anaesthesia 2010;65(2):145–153; doi: 10.1111/j.1365-2044.2009.06136.x
95. Raksakulkiat S, Punpuckdeekoon P. A comparison of meperidine and fentanyl for labor pain reduction in Phramongkutklao Hospital. J Med Assoc Thai 2019;102(2):197–202.
96. Choi J-W, Lee J, Jung SJ, et al. Use of sedative-hypnotics and mortality: A population-based retrospective cohort study. J Clin Sleep Med 2018;14(10):1669–1677; doi: 10.5664/jcsm.7370
97. Kaufmann CN, Spira AP, Alexander C, et al. Trends in prescribing of sedative-hypnotic medications in the United States: 1993–2010. Pharmacoepidemiol Drug Saf 2016;25(6):637–645; doi: 10.1002/pds.3951
98. Bais B, Molenaar NM, Bijma HH, et al. Prevalence of benzodiazepines and benzodiazepine-related drugs expo-

sure before, during and after pregnancy: A systematic review and meta-analysis. J Affect Disord 2020;269:18–27; doi: 10.1016/j.jad.2020.03.014
99. Votaw VR, Geyer R, Rieselbach MM, et al. The epidemiology of benzodiazepine misuse: A systematic review. Drug Alcohol Depend 2019;200:95–114; doi: 10.1016/j.drugalcdep.2019.02.033
100. Tobias S, Shapiro AM, Grant CJ, et al. Drug checking identifies counterfeit alprazolam tablets. Drug Alcohol Depend 2021;218:108300.
101. McAuley A, Matheson C, Robertson JR. From the clinic to the street: The changing role of benzodiazepines in the Scottish overdose epidemic. Int J Drug Policy 2022;100:103512.
102. Tupper KW, McCrae K, Garber I, et al. Initial results of a drug checking pilot program to detect fentanyl adulteration in a Canadian setting. Drug Alcohol Depend 2018;190:242–245; doi: 10.1016/j.drugalcdep.2018.06.020
103. Laing MK, Ti L, Marmel A, et al. An outbreak of novel psychoactive substance benzodiazepines in the unregulated drug supply: Preliminary results from a community drug checking program using point-of-care and confirmatory methods. Int J Drug Policy 2021;93:103169.
104. Nishimura A, Furugen A, Umazume T, et al. Benzodiazepine concentrations in the breast milk and plasma of nursing mothers: Estimation of relative infant dose. Breastfeed Med 2021;16(5):424–431; doi: 10.1089/bfm.2020.0259
105. Payne JL. Psychopharmacology in pregnancy and breastfeeding. Med Clin North Am 2019;103(4):629–650.
106. Gilder ME, Tun NW, Carter A, et al. Outcomes for 298 breastfed neonates whose mothers received ketamine and diazepam for postpartum tubal ligation in a resource-limited setting. BMC Pregnancy Childbirth 2021;21(1):121.
107. Uguz F. A new safety scoring system for the use of psychotropic drugs during lactation. Am J Ther 2021;28(1):e118–e126.
108. Miller MA, Mehta N, Clark-Bilodeau C, et al. Sleep pharmacotherapy for common sleep disorders in pregnancy and lactation. Chest 2020;157(1):184–197.
109. Damkier P, Videbech P, Larsen ER. Use of psychotropic drugs during pregnancy and breast-feeding. Acta Psychiatr Scand 2016;133(5):429–430.
110. Betcher HK, Wisner KL. Psychotropic treatment during pregnancy: Research synthesis and clinical care principles. J Womens Health 2020;29(3):310–318.
111. Kaplan YC, Demir O. Use of phenytoin, phenobarbital carbamazepine, levetiracetam lamotrigine and valproate in pregnancy and breastfeeding: Risk of major malformations, dose-dependency, monotherapy vs polytherapy, pharmacokinetics and clinical implications. Curr Neuropharmacol 2021;19(11):1805–1824.
112. Bollig KJ, Jackson DL. Seizures in pregnancy. Obstet Gynecol Clin North Am 2018;45(2):349–367.
113. Anderson PO. Antiepileptic drugs during breastfeeding. Breastfeed Med 2020;15(1):2–4.
114. Drugs and Lactation Database (LactMed). Gabapentin. National Library of Medicine: Bethesda, MD, USA; 2006.
115. Fujimura K, Mitsuhashi T, Takahashi T. Adverse effects of prenatal and early postnatal exposure to antiepileptic drugs: Validation from clinical and basic researches. Brain Dev 2017;39(8):635–643.
116. McAllister-Williams RH, Baldwin DS, Cantwell R, et al. British Association for Psychopharmacology consensus guidance on the use of psychotropic medication preconception, in pregnancy and postpartum 2017. J Psychopharmacol 2017;31(5):519–552.
117. Thorsness KR, Watson C, LaRusso EM. Perinatal anxiety: Approach to diagnosis and management in the obstetric setting. Am J Obstet Gynecol 2018;219(4):326–345.
118. Kronenfeld N, Baran TZ, Berlin M, et al. Chronic use of psychotropic medications in breastfeeding women: Is it safe? PLoS One 2018;13(5):e0197196.
119. Madgula RM, Groshkova T, Mayet S. Illicit drug use in pregnancy: Effects and management. Expert Rev Obstet Gynecol 2011;6(2):179–192; doi: 10.1586/eog.10.54
120. Camacho X, Zoega H, Gomes T, et al. The association between psychostimulant use in pregnancy and adverse maternal and neonatal outcomes: Results from a distributed analysis in two similar jurisdictions. Int J Epidemiol 2023;52(1):190–202; doi: 10.1093/ije/dyac180
121. Admon LK, Bart G, Kozhimannil KB, et al. Amphetamine- and opioid-affected births: Incidence, outcomes, and costs, United States, 2004–2015. Am J Public Health 2019;109(1):148–154; doi: 10.2105/AJPH.2018.304771
122. Bailey DN. Cocaine and cocaethylene binding to human milk. Am J Clin Pathol 1998;110(4):491–494; doi: 10.1093/ajcp/110.4.491
123. Winecker RE, Goldberger BA, Tebbett IR, et al. Detection of Cocaine and Its Metabolites in Breast. 2001.
124. Marchei E, Escuder D, Pallas CR, et al. Simultaneous analysis of frequently used licit and illicit psychoactive drugs in breast milk by liquid chromatography tandem mass spectrometry. J Pharm Biomed Anal 2011;55(2):309–316; doi: 10.1016/j.jpba.2011.01.028
125. Resende dos Santos R, Jose Nunes Paisa M, Cesar Veloso J, et al. Efficient extraction method using magnetic carbon nanotubes to analyze cocaine and benzoylecgonine in breast milk by GC/MS. Bioanalysis 2017;9(21):1655–1666; doi: 10.4155/bio-2017-0140
126. Silveira G de O, Belitsky ÍT, Loddi S, et al. Development of a method for the determination of cocaine, cocaethylene and norcocaine in human breast milk using liquid phase microextraction and gas chromatography-mass spectrometry. Forensic Sci Int 2016;265:22–28; doi: 10.1016/j.forsciint.2016.01.007
127. Chomchai C, Chomchai S, Kitsommart R. Transfer of methamphetamine (MA) into breast milk and urine of postpartum women who smoked MA tablets during pregnancy: Implications for initiation of breastfeeding. J Hum Lact 2016;32(2):333–339; doi: 10.1177/0890334415610080
128. 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; doi: 10.1111/j.1365-2125.2009.03366.x
129. Chasnoff I, Lewis D, Squires L. Cocaine intoxication in a breast-fed infant. Pediatrics 1987;80:836–838.
130. Park JN, Rashidi E, Foti K, et al. Fentanyl and fentanyl analogs in the illicit stimulant supply: Results from U.S. drug seizure data, 2011–2016. Drug Alcohol Depend 2021;218(June 2020):108416; doi: 10.1016/j.drugalcdep.2020.108416

131. Steiner E, Villen T, Hallberg M, et al. Amphetamine secretion in breast milk. Eur J Clin Pharmacol 1984;27:123–124.
132. Öhman I, Wikner BN, Beck O, et al. Narcolepsy treated with racemic amphetamine during pregnancy and breastfeeding. J Hum Lact 2015;31(3):374–376; doi: 10.1177/0890334415585067
133. Ilett KF, Hackett LP, Kristensen JH, et al. Transfer of dexamphetamine into breast milk during treatment for attention deficit hyperactivity disorder. Br J Clin Pharmacol 2007;63(3):371–375; doi: 10.1111/j.1365-2125.2006.02767.x
134. Kristianssona B, Ghanib NA, Eriksson M, et al. Use of Khat in lactating women: A pliot study on breast-milk secretion. J Ethnopharmacol 1987;21:85–90; doi: 10.1016/0378-8741(87)90097-3
135. Smid MC, Meta TD, Gordon AJ. Stimulant use in pregnancy. Clin Obstet Gynecol 2019;62(1):168–184.
136. de la Torre R, Farré M, Roset PN, et al. Human pharmacology of MDMA: Pharmacokinetics, metabolism, and disposition. Ther Drug Monit 2004;26(2):137–144; doi: 10.1097/00007691-200404000-00009
137. Mello NK, Mendelson JH. Cocaine's effects on neuroendocrine systems: Clinical and preclinical studies. Pharmacol Biochem Behav 1997;57(3):571–599; doi: 10.1016/S0091-3057(96)00433-9
138. Patkar AA, Hill KP, Sterling RC, et al. Serum prolactin and response to treatment among cocaine-dependent individuals. Addict Biol 2002;7(1):45–53; doi: 10.1080/13556210120010059
139. DeLeo V, Cella SG, Camanni F, et al. Prolactin lowering effect of amphetamine in normoprolactinemic subjects and in physiological and pathological hyperprolactinemia. Horm Metab Res 1983;15(9):439–443; doi: 10.1055/s-2007-1018749
140. Petraglia F, de Leo V, Sardelli S, et al. Prolactin changes after administration of agonist and antagonist dopaminergic drugs in puerperal women. Gynecol Obstet Invest 1987;23(2):103–109; doi: 10.1159/000298843
141. Chaney N, Franke J, Wadlington WB. Cocaine convulsions in a breast-feeding baby. J Pediatr 1988;112(1):134–135; doi: 10.1016/s0022-3476(88)80139-2
142. Mihretu A, Teferra S, Fekadu A. What constitutes problematic khat use? An exploratory mixed methods study in Ethiopia. Subst Abuse Treat Prev Policy 2017;12(1):1–12; doi: 10.1186/s13011-017-0100-y
143. Ariagno R, Karch S, Middleberg R, et al. Methamphetamine ingestion by a breast-feeding mother and her infant's death: People v Henderson. JAMA 1995;274(3):215–215; doi: 10.1001/jama.1995.03530030035020
144. Kenneally M, Byard RW. Increasing methamphetamine detection in cases of early childhood fatalities. J Forensic Sci 2020;65(4):1376–1378; doi: 10.1111/1556-4029.14321
145. Tse R, Kesha K, Morrow P, et al. Commentary on: Kenneally M, Byard RW. Increasing methamphetamine detection in cases of early childhood fatalities. J Forensic Sci 2020;65(4):1384–1384; doi: 10.1111/1556-4029.14459
146. Bohm MK, Liu Y, Esser MB, et al. Binge drinking among adults, by select characteristics and state—United States, 2018. MMWR Morb Mortal Wkly Rep 2021;70(41):1441–1446; doi: 10.15585/mmwr.mm7041a2
147. Bakhireva LN, Shrestha S, Garrison L, et al. Prevalence of alcohol use in pregnant women with substance use disorder. Drug Alcohol Depend 2018;187:305–310; doi: 10.1016/j.drugalcdep.2018.02.025
148. Denny CH, Acero CS, Terplan M, et al. Trends in alcohol use among pregnant women in the U.S., 2011–2018. Am J Prev Med 2020;59(5):768–769; doi: 10.1016/j.amepre.2020.05.017
149. Mårdby A-C, Lupattelli A, Hensing G, et al. Consumption of alcohol during pregnancy—A multinational European study. Women Birth 2017;30(4):e207–e213; doi: 10.1016/j.wombi.2017.01.003
150. Oei JL. Alcohol use in pregnancy and its impact on the mother and child. Addiction 2020;115(11):2148–2163; doi: 10.1111/ADD.15036
151. Wilson J, Tay RY, McCormack C, et al. Alcohol consumption by breastfeeding mothers: Frequency, correlates and infant outcomes. Drug Alcohol Rev 2017;36(5):667–676; doi: 10.1111/DAR.12473
152. Gibson L, Porter M. Drinking or smoking while breastfeeding and later academic outcomes in children. Nutrients 2020;12(3):829; doi: 10.3390/NU12030829
153. Dumas A, Toutain S, Simmat-Durand L. Alcohol use during pregnancy or breastfeeding: A national survey in France. J Womens Health 2017;26(7):798–805; doi: 10.1089/JWH.2016.6130
154. Graves L, Carson G, Poole N, et al. Guideline no. 405: Screening and counselling for alcohol consumption during pregnancy. J Obstet Gynaecol Can 2020;42(9):1158.e1–1173.e1; doi: 10.1016/J.JOGC.2020.03.002
155. Haastrup MB, Pottegård A, Damkier P. Alcohol and breastfeeding. Basic Clin Pharmacol Toxicol 2014;114(2):168–173; doi: 10.1111/BCPT.12149
156. Ho E, Collantes A, Kapur BM, et al. Alcohol and breast feeding: Calculation of time to zero level in milk. Biol Neonate 2001;80(3):219–222; doi: 10.1159/000047146
157. Cobo E. Effect of different doses of ethanol on the milk-ejecting reflex in lactating women. Am J Obstet Gynecol 1973;115(6):817–821; doi: 10.1016/0002-9378(73)90526-7
158. Dejong K, Olyaei A, Lo JO. Alcohol use in pregnancy. Clin Obstet Gynecol 2019;62(1):142–142; doi: 10.1097/GRF.0000000000000414
159. Mennella JA. Regulation of milk intake after exposure to alcohol in mothers' milk. Alcohol Clin Exp Res 2001;25(4):590–593; doi: 10.1111/j.1530-0277.2001.tb02254.x
160. Sachs HC. The transfer of drugs and therapeutics into human breast milk: An update on selected topics. Pediatrics 2013;132(3):e796–e809; doi: 10.1542/PEDS.2013-1985
161. Gibson L, Porter M. Drinking or smoking while breastfeeding and later cognition in children. Pediatrics 2018;142(2):e20174266; doi: 10.1542/PEDS.2017-4266/37569
162. Eidelman AI. Smoking, vaping, while breastfeeding in the era of COVID-19. Breastfeed Med 2021;16(10):765; doi: 10.1089/bfm.2021.29192.aie
163. Singh PK, Singh L, Wehrmeister FC, et al. Prevalence of smoking and smokeless tobacco use during breastfeeding: A cross-sectional secondary data analysis based on 0.32 million sample women in 78 low-income and middle-income countries. eClinicalMedicine 2022;53:101660; doi: 10.1016/j.eclinm.2022.101660
164. Myr R. Promoting, protecting, and supporting breastfeeding in a community with a high rate of tobacco use.

J Hum Lact 2004;20(4):415–416; doi: 10.1177/0890334404269906
165. Carswell AL, Ward KD, Vander Weg MW, et al. Prospective associations of breastfeeding and smoking cessation among low-income pregnant women. Matern Child Nutr 2018;14(4):e12622; doi: 10.1111/mcn.12622
166. Dorea JG. Maternal smoking and infant feeding: Breastfeeding is better and safer. Matern Child Health J 2007;11(3):287–291; doi: 10.1007/s10995-006-0172-1
167. Calvaresi V, Escuder D, Minutillo A, et al. Transfer of nicotine, cotinine and caffeine into breast milk in a smoker mother consuming caffeinated drinks. J Anal Toxicol 2016;40(6):473–477; doi: 10.1093/jat/bkw034
168. Dahlström A, Ebersjö C, Lundell B. Nicotine exposure in breastfed infants. Acta Paediatr Oslo Nor 1992 2004;93(6):810–816.
169. Napierala M, Mazela J, Merritt TA, et al. Tobacco smoking and breastfeeding: Effect on the lactation process, breast milk composition and infant development. A critical review. Environ Res 2016;151:321–338; doi: 10.1016/j.envres.2016.08.002
170. Nordenstam F, Lundell B, Edstedt Bonamy A-K, et al. Snus users had high levels of nicotine, cotinine and 3-hydroxycotinine in their breastmilk, and the clearance was slower than in smoking mothers. Acta Paediatr Oslo Nor 1992 2019;108(7):1250–1255; doi: 10.1111/apa.14602
171. Vio F, Salazar G, Infante C. Smoking during pregnancy and lactation and its effects on breast-milk volume. Am J Clin Nutr 1991;54(6):1011–1016; doi: 10.1093/ajcn/54.6.1011
172. Adgent MA. Environmental tobacco smoke and sudden infant death syndrome: A review. Birth Defects Res B Dev Reprod Toxicol 2006;77(1):69–85; doi: 10.1002/bdrb.20068
173. Fleming P, Blair PS. Sudden infant death syndrome and parental smoking. Early Hum Dev 2007;83(11):721–725; doi: 10.1016/j.earlhumdev.2007.07.011
174. Chang C, Vivekanandarajah A, Waters KA, et al. Cell death in the lateral geniculate nucleus, and its possible relationship with nicotinic receptors and sudden infant death syndrome (SIDS). Mol Neurobiol 2023;60(7):4120–4131; doi: 10.1007/s12035-023-03332-9
175. Miranda RA, Gaspar de Moura E, Lisboa PC. Tobacco smoking during breastfeeding increases the risk of developing metabolic syndrome in adulthood: Lessons from experimental models. Food Chem Toxicol 2020;144:111623; doi: 10.1016/j.fct.2020.111623
176. Batstra L, Neeleman J, Hadders-Algra M. Can breast feeding modify the adverse effects of smoking during pregnancy on the child's cognitive development? J Epidemiol Community Health 2003;57(6):403–404; doi: 10.1136/jech.57.6.403
177. Nafstad P, Jaakkola J, Hagen J, et al. Breastfeeding, maternal smoking and lower respiratory tract infections. Eur Respir J 1996;9(12):2623–2629; doi: 10.1183/09031936.96.09122623
178. Ip S, Chung M, Raman G, et al. Breastfeeding and maternal and infant health outcomes in developed countries. Evid Rep Technol Assess 2007;(153):1–186.
179. Bahji A, Stephenson C. International perspectives on the implications of cannabis legalization: A systematic review & thematic analysis. Int J Environ Res Public Health 2019;16(17):3095; doi: 10.3390/ijerph16173095
180. Corsi DJ, Hsu H, Weiss D, et al. Trends and correlates of cannabis use in pregnancy: A population-based study in Ontario, Canada from 2012 to 2017. Can J Public Health 2019;110(1):76–84; doi: 10.17269/s41997-018-0148-0
181. Towobola A, Towobola B, Nair B, et al. The ethics and management of cannabis use in pregnancy following decriminalisation and licensing for medical use: Narrative review. BJPsych Bull 2021;1–10; doi: 10.1192/BJB.2021.102
182. Lucas CJ, Galettis P, Schneider J. The pharmacokinetics and the pharmacodynamics of cannabinoids. Br J Clin Pharmacol 2018;84(11):2477–2482; doi: 10.1111/BCP.13710
183. Moss MJ, Bushlin I, Kazmierczak S, et al. Cannabis use and measurement of cannabinoids in plasma and breast milk of breastfeeding mothers. Pediatr Res 2021;90(4):861–868; doi: 10.1038/S41390-020-01332-2
184. Wymore EM, Palmer C, Wang GS, et al. Persistence of δ-9-tetrahydrocannabinol in human breast milk. JAMA Pediatr 2021;175(6):632–634; doi: 10.1001/JAMAPEDIATRICS.2020.6098
185. Joseph P, Vettraino IM. Cannabis in pregnancy and lactation—A review. Mo Med 2020;117(5):400–405.
186. Baker T, Datta P, Rewers-Felkins K, et al. Transfer of inhaled cannabis into human breast milk. Obstet Gynecol 2018;131(5):783–788; doi: 10.1097/AOG.0000000000002575
187. Bertrand KA, Hanan NJ, Honerkamp-Smith G, et al. Marijuana use by breastfeeding mothers and cannabinoid concentrations in breast milk. Pediatrics 2018;142(3):e20181076; doi: 10.1542/PEDS.2018-1076
188. Badowski S, Smith G. Cannabis use during pregnancy and postpartum. Can Fam Physician Med Fam Can 2020;66(2):98–103.
189. Crume TL, Juhl AL, Brooks-Russell A, et al. Cannabis use during the perinatal period in a state with legalized recreational and medical marijuana: The association between maternal characteristics, breastfeeding patterns, and neonatal outcomes. J Pediatr 2018;197:90–96; doi: 10.1016/j.jpeds.2018.02.005
190. Murphy LL, Muñoz RM, Adrian BA, et al. Function of cannabinoid receptors in the neuroendocrine regulation of hormone secretion. Neurobiol Dis 1998;5(6 Pt B):432–446; doi: 10.1006/nbdi.1998.0224
191. Ranganathan M, Braley G, Pittman B, et al. The effects of cannabinoids on serum cortisol and prolactin in humans. Psychopharmacology (Berl) 2009;203(4):737–744; doi: 10.1007/s00213-008-1422-2
192. Olusi SO. Hyperprolactinaemia in patients with suspected cannabis-induced gynaecomastia. Lancet Lond Engl 1980;1(8162):255; doi: 10.1016/s0140-6736(80)90738-2
193. Harmon J, Aliapoulios MA. Gynecomastia in marihuana users. N Engl J Med 1972;287(18):936; doi: 10.1056/NEJM197211022871824
194. Josan C, Shiplo S, Fusch G, et al. Cannabis use during lactation may alter the composition of human breast milk. Pediatr Res 2023;93(7):1959–1968; doi: 10.1038/s41390-022-02315-1
195. Martin GI. Marijuana: The effects on pregnancy, the fetus, and the newborn. J Perinatol 2020;40(10):1470–1476; doi: 10.1038/s41372-020-0708-z
196. Zucker I. Psychoactive drug exposure during breastfeeding: A critical need for preclinical behavioral testing.

Psychopharmacology (Berl) 2018;235(5):1335–1346; doi: 10.1007/S00213-018-4873-0
197. Astley SJ, Little RE. Maternal marijuana use during lactation and infant development at one year. Neurotoxicol Teratol 1990;12(2):161–168; doi: 10.1016/0892-0362(90)90129-z
198. Adis Medical W. When treating pregnant women with opioid use disorder, the benefits of using opioid maintenance treatment outweigh the risks. Drugs Ther Perspect 2016;32(5):186–190; doi: 10.1007/s40267-016-0281-x
199. Ambasta A, Malebranche M. Opioid use disorder in pregnancy. CMAJ 2019;191(38):E1057; doi: 10.1503/cmaj.190391
200. Wojnar-Horton RE, Kristensen JH, Yapp P, et al. Methadone distribution and excretion into breast milk of clients in a methadone maintenance programme. Br J Clin Pharmacol 1997;44(6):543–547; doi: 10.1046/j.1365-2125.1997.t01-1-00624.x
201. Drugs and Lactation Database (LactMed). Methadone. National Library of Medicine: Bethesda, MD, USA; 2006.
202. Anderson PO. Opioid use disorder during breastfeeding. Breastfeed Med 2023;18(6):410–412; doi: 10.1089/bfm.2023.0088
203. Jansson LM, Choo R, Velez ML, et al. Methadone maintenance and breastfeeding in the neonatal period. Pediatrics 2008;121(1):106–114; doi: 10.1542/peds.2007-1182
204. Klaman SL, Isaacs K, Leopold A, et al. Treating women who are pregnant and parenting for opioid use disorder and the concurrent care of their infants and children: Literature review to support national guidance. J Addict Med 2017;11(3):178–190; doi: 10.1097/ADM.0000000000000308
205. Ilett KF, Hackett LP, Gower S, et al. Estimated dose exposure of the neonate to buprenorphine and its metabolite norbuprenorphine via breastmilk during maternal buprenorphine substitution treatment. Breastfeed Med 2012;7:269–274; doi: 10.1089/bfm.2011.0096
206. Jansson LM, Spencer N, McConnell K, et al. Maternal buprenorphine maintenance and lactation. J Hum Lact 2016;32(4):675–681; doi: 10.1177/0890334416663198
207. O'Connor AB, Collett A, Alto WA, et al. Breastfeeding rates and the relationship between breastfeeding and neonatal abstinence syndrome in women maintained on buprenorphine during pregnancy. J Midwifery Womens Health 2013;58(4):383–388; doi: 10.1111/jmwh.12009
208. Gower S, Bartu A, Ilett KF, et al. The wellbeing of infants exposed to buprenorphine via breast milk at 4 weeks of age. J Hum Lact 2014;30(2):217–223; doi: 10.1177/0890334413517748
209. Johnson RE, Jones HE, Jasinski DR, et al. Buprenorphine treatment of pregnant opioid–dependent women: Maternal and neonatal outcomes. Drug Alcohol Depend 2001;63(1):97–103; doi: 10.1016/s0376-8716(00)00194-0
210. Marquet P, Chevrel J, Lavignasse P, et al. Buprenorphine withdrawal syndrome in a newborn. Clin Pharmacol Ther 1997;62(5):569–571; doi: 10.1016/S0009-9236(97)90053-9
211. Wong J, Saver B, Scanlan JM, et al. Does maternal buprenorphine dose affect severity or incidence of neonatal abstinence syndrome? J Addict Med 2018;12(6):435–441; doi: 10.1097/ADM.0000000000000427
212. Brown HL. Opioid management in pregnancy and postpartum. Obstet Gynecol Clin North Am 2020;47(3):421–427; doi: 10.1016/j.ogc.2020.04.005
213. Chan CF, Page-Sharp M, Kristensen JH, et al. Transfer of naltrexone and its metabolite 6,beta-naltrexol into human milk. J Hum Lact 2004;20(3):322–326; doi: 10.1177/0890334404266881
214. Haber PS, Riordan BC, Winter DT, et al. New Australian guidelines for the treatment of alcohol problems: An overview of recommendations. Med J Aust 2021;215 Suppl(S7):S3–S32; doi: 10.5694/MJA2.51254
215. Reus VI, Fochtmann LJ, Bukstein O, et al. The American Psychiatric Association practice guideline for the pharmacological treatment of patients with alcohol use disorder. Am J Psychiatry 2018;175(1):86–90; doi: 10.1176/APPI.AJP.2017.1750101
216. Williams JF, Smith VC, Committee on Substance Abuse T, et al. Fetal alcohol spectrum disorders. Pediatrics 2015;136(5):e1395–e1406; doi: 10.1542/PEDS.2015-3113
217. Rigotti NA, Kruse GR, Livingstone-Banks J, et al. Treatment of tobacco smoking: A review. JAMA 2022;327(6):566–577; doi: 10.1001/jama.2022.0395
218. Baker TB, Piper ME, Stein JH, et al. Effects of nicotine patch vs varenicline vs combination nicotine replacement therapy on smoking cessation at 26 weeks: A randomized clinical trial. JAMA 2016;315(4):371–379; doi: 10.1001/jama.2015.19284
219. Maritz GS. Are nicotine replacement therapy, varenicline or bupropion options for pregnant mothers to quit smoking? Effects on the respiratory system of the offspring. Ther Adv Respir Dis 2009;3(4):193–210; doi: 10.1177/1753465809343712
220. Anderson PO. Breastfeeding with smoking cessation products. Breastfeed Med 2021;16(10):766–768; doi: 10.1089/bfm.2021.0230
221. Pfizer Labs. Chantix (Varenicline) [Package Insert]. 2008. Available from: https://www.accessdata.fda.gov/drugsatfda_docs/label/2008/021928s008lbl.pdf [Last accessed: December 5, 2022].
222. Howes S, Hartmann-Boyce J, Livingstone-Banks J, et al. Antidepressants for smoking cessation. Cochrane Database Syst Rev 2020;4:CD000031; doi: 10.1002/14651858.CD000031.pub5
223. Haas JS, Kaplan CP, Barenboim D, et al. Bupropion in breast milk: An exposure assessment for potential treatment to prevent post-partum tobacco use. Tob Control 2004;13(1):52–56; doi: 10.1136/tc.2003.004093
224. Allen S, Thomas J, Harrison K, et al. Bupropion for postpartum smoking relapse: A remote protocol for a two-arm, double-blind, placebo-controlled randomized clinical trial. Contemp Clin Trials 2021;105:106352; doi: 10.1016/j.cct.2021.106352
225. Hartmann-Boyce J, McRobbie H, Lindson N, et al. Electronic cigarettes for smoking cessation. Cochrane Database Syst Rev 2020;10:CD010216; doi: 10.1002/14651858.CD010216.pub4
226. Chan GCK, Stjepanović D, Lim C, et al. A systematic review of randomized controlled trials and network meta-analysis of e-cigarettes for smoking cessation. Addict Behav 2021;119:106912; doi: 10.1016/j.addbeh.2021.106912
227. Cleary E, McKiever M, Gonzales-Brown V, et al. Multidisciplinary Oud group prenatal care decreases NICU admissions and duration of treatment for NAS. Obstet Gynecol 2020;135:163S.

228. Byerley BM, Haas DM. A systematic overview of the literature regarding group prenatal care for high-risk pregnant women. BMC Pregnancy Childbirth 2017;17(1): 329; doi: 10.1186/s12884-017-1522-2
229. Francis J, Mildon A, Stewart S, et al. Breastfeeding rates are high in a prenatal community support program targeting vulnerable women and offering enhanced postnatal lactation support: A prospective cohort study. Int J Equity Health 2021;20(1):71; doi: 10.1186/s12939-021-01386-6
230. Rhodes EC, Damio G, LaPlant HW, et al. Promoting equity in breastfeeding through peer counseling: The US Breastfeeding Heritage and Pride program. Int J Equity Health 2021;20(1):128; doi: 10.1186/s12939-021-01408-3
231. Ahluwalia IB, Tessaro I, Grummer-Strawn LM, et al. Georgia's breastfeeding promotion program for low-income women. Pediatrics 2000;105(6):E85; doi: 10 .1542/peds.105.6.e85
232. Huhn AS, Hobelmann JG, Oyler GA, et al. Protracted renal clearance of fentanyl in persons with opioid use disorder. Drug Alcohol Depend 2020;214:108147; doi: 10 .1016/j.drugalcdep.2020.108147
233. Shearer D, Young S, Fairbairn N, et al. Challenges with buprenorphine inductions in the context of the fentanyl overdose crisis: A case series. Drug Alcohol Rev 2022; 41(2):444–448; doi: 10.1111/dar.13394
234. Wallman C, Baessler C, Hoffman JM. Marijuana, breastfeeding, and the use of human milk: Position statement #3071. Adv Neonatal Care 2021;21(3):176–177; doi: 10.1097/ANC.0000000000000904
235. Ryan SA, Ammerman SD, O'Connor ME, et al. Marijuana use during pregnancy and breastfeeding: Implications for neonatal and childhood outcomes. Pediatrics 2018;142(3): e20181889; doi: 10.1542/PEDS.2018-1889
236. American College of Obstetricians and Gynecologists Committee on Health Care for Undeserved Women. Committee opinion no. 722: Marijuana use during pregnancy and lactation. Obstet Gynecol 2017;130(4):e205–e209; doi: 10.1097/AOG.0000000000002354
237. Lexicomp. Lexicomp: Evidence-Based Drug Treatment Information. n.d.
238. Jufer RA, Wstadik A, Walsh SL, et al. Elimination of cocaine and metabolites in plasma, saliva, and urine following repeated oral administration to human volunteers. J Anal Toxicol 2000;24(7):467–477; doi: 10.1093/jat/24.7 .467
239. Harris DS, Boxenbaum H, Everhart ET, et al. The bioavailability of intranasal and smoked methamphetamine. Clin Pharmacol Ther 2003;74(5):475–486; doi: 10.1016/j .clpt.2003.08.002
240. Toennes SW, Harder S, Schramm M, et al. Pharmacokinetics of cathinone, cathine and norephedrine after the chewing of khat leaves. Br J Clin Pharmacol 2003;56(1): 125–130; doi: 10.1046/j.1365-2125.2003.01834.x

ABM protocols expire 5 years from the date of publication. Content of this protocol is up to date at the time of publication. Evidence-based revisions are made within 5 years or sooner if there are significant changes in the evidence

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