

## Evidence Summary

### Substance Use Treatment for Pregnant and Postpartum Women

Substance use during and after pregnancy can create significant harm for mothers and infants, as well as major public health concerns. Tobacco is the most prevalent substance used in this period, followed by alcohol, cannabis, and other illicit drugs. However, polysubstance use in pregnancy is common and increases the deleterious outcomes for both mother and child (Forray, 2016; Forray & Foster, 2015; McHugh, Wigderson, & Greenfield, 2014).

Risks increased by substance use during pregnancy include negative birth outcomes such as stillbirth, miscarriage, low birthweight, or preterm delivery. Some substances place pregnant women at high risk for placental abruption, premature rupture of the membranes, and preeclampsia (Forray, 2016). Because substances cross the placenta, the effects on fetal development are profound, and neonates are at risk for birth deformities, behavioral impairments, and possible withdrawal syndrome (McHugh et al., 2014). Teratology, the scientific study of congenital abnormalities, examines how foreign substances in the prenatal period affect a child's central nervous system (CNS) and behavior. Scientists believe that prenatal CNS damage affects the fetal development of the child and can result in long-term impairments (Minnes, Lang, & Singer, 2011).

A recently released report by the Centers for Disease Control and Prevention (CDC) stated that three out of four women who wish to become pregnant do not stop drinking when they stop using birth control (Green, McKnight-Eily, Tan, Mejia, & Denny, 2016). In addition, a 2012 National Survey on Drug Use and Health (NSDUH) reported that 5.9 percent of pregnant women used illicit drugs, affecting 380,000 offspring; 8.5 percent women drank alcohol, affecting over 550,000 offspring; and 15.9 percent women smoked cigarettes, exposing over a million developing fetuses to tobacco (Forray, 2016). Further, between 2000 and 2009, the prevalence of opioid use in pregnancy increased fivefold, in keeping with the growing opiate epidemic in the United States. (Forray, 2016).

Despite the number of women who continue to use substances during pregnancy, the 2015 NSDUH reported significant decreases in substance use among pregnant women, compared with nonpregnant women (Center for Behavioral Health Statistics and Quality [CBHSQ], 2016). However, the prevalence of substance use in the months after delivery was greater than use during pregnancy, suggesting that many women attempt abstinence during pregnancy but return to substance use after the baby's birth (Chapman & Wu, 2013; Forray et al., 2015). Forray et al. (2015) reported abstinence among 96 percent of women who were heavy drinkers, 78 percent of women who used cocaine, and 38 percent of women who smoked; yet there was a

significant rise in substance use among previously abstinent mothers during the second 6 months of the baby's first year (relapse of 58 percent of smokers, 41 percent of cannabis users, and 41 percent of cocaine users). In sum, all forms of substance use tend to decrease among women during pregnancy, but a significant number of women relapse and return to substance use during the first year of the baby's life, defined as the postpartum period.

## History of Problem

Public health concerns about substance use in pregnant women began in the second half of the 20th century (Burns, Coleman-Cowger, & Breen, 2016). Initial public health crises were triggered inadvertently because pregnant mothers took prescribed medications to prevent miscarriages (DES in the 1940s and 1950s) or to treat nausea in pregnancy (thalidomide in 1958). The congenital abnormalities of offspring of mothers who took these two drugs heightened medical concern of how drugs in pregnancy can harm the fetus. Eventually, in the 1970s and 1980s, researchers became knowledgeable about effects of large amounts of alcohol and cocaine on the fetus and developing child.

Currently, there is increased concern about use of cannabis, prescription pain relievers, and other illicit drugs during pregnancy. Individual substances—tobacco, alcohol, cannabis, cocaine, methamphetamine, and opioids—are known to have specific toxic effects on the mother in pregnancy and indirect effects on the developing fetus. The extent of the specific substance's use and the timing of exposure to the fetus influence the varying effects of perinatal substance use on both mother and child (Forray, 2016).

## Prevalence and Effects of Specific Substances

### Tobacco

Despite widespread knowledge about the dangers of smoking (Coleman-Cowger, Anderson, Mahoney, & Schulkin, 2014), tobacco is the most prevalent legal substance used by mothers during pregnancy and the postpartum period (Forray & Foster, 2015). The recent 2015 NSDUH (CBHSQ, 2016) estimated that in 2014 in the United States, 11.4 percent of pregnant women ages 15 to 44 used cigarettes in the past month, compared with 22.5 percent of nonpregnant women. Yet in 2015, 13.6 percent of pregnant women used cigarettes, compared with 21.4 percent of nonpregnant women. Notably, more pregnant women ages 18 to 25 used cigarettes in 2015 than nonpregnant women in the same age group. These findings suggest an increase in the number of women who used cigarettes during pregnancy, particularly among younger women.

The NSDUH further reported that 0.2 percent of pregnant women used smokeless tobacco (dissolvable tobacco products or e-cigarettes) in 2015, compared with 0.7 percent of nonpregnant women (CBHSQ, 2016). Smokeless tobacco is considered by some health professionals as a harm reduction tool and not as unsafe as cigarettes (England, Anderson, Tong, et al., 2014). However, the Surgeon General's report on e-cigarettes (U.S. Department of Health and Human Services [HHS], 2016) stated that fetal exposure to nicotine delivered in any form, including e-cigarettes, "adversely affects maternal and fetal health during pregnancy, contributing to multiple adverse outcomes such as preterm delivery and stillbirth" (p. 99).

Reportedly, e-cigarette use has increased at a significant rate among youth and young adults in recent years and is now used among American youth more than any other tobacco product.

There are numerous well-documented effects on both mother and child when the mother smokes during pregnancy (Coleman-Cowger et al., 2014; England et al., 2014; HHS, 2016; Minnes et al., 2011). Studies report pregnancy complications for mothers, such as ectopic pregnancy, placental abruption, placenta previa, and an increased risk of mortality with preeclampsia. For the neonate, low birth weight, prematurity, decreased head circumference, and intrauterine death have been linked to maternal smoking. Some studies suggest the risk of sudden infant death syndrome (SIDS) is doubled, and neonates show signs of CNS stress, evidenced by excitability, increased muscle tension, and difficulties being calmed. During the first year of development, infants repeatedly had challenges with emotional self-regulation and showed more sadness, presenting behavioral challenges for mothers in the postpartum period.

### Alcohol

During 2011 to 2013, the CDC estimated the prevalence of alcohol use and binge drinking (four or more drinks on one occasion) among U.S. pregnant and nonpregnant women (ages 18 to 44). In this study, 10.2 percent of pregnant women drank alcohol in the past 30 days, compared with 53.6 percent of nonpregnant women; and 3.1 percent of pregnant women reported binge drinking, compared with 18.2 percent of nonpregnant women (Tan, Denny, Cheal, Sniezek, & Kanny, 2015). Showing a slight overall decline in alcohol use in pregnancy, findings from the 2015 NSDUH (CBHSQ, 2016) reported 9.3 percent of U.S. women drank during pregnancy, compared with 54.8 percent of nonpregnant women.

Although overall alcohol use appeared to decrease, an increase in binge drinking was reported among pregnant women. In the 2015 NSDUH, 4.6 percent of pregnant women engaged in binge drinking in the previous month, compared with 29.7 percent of nonpregnant women. Furthermore, 7.1 percent of pregnant women, aged 18 to 25, and 38.3 percent of same-aged nonpregnant women reported binge drinking. These findings indicate an increase in binge drinking among young women—both pregnant and nonpregnant—during the past decade. Tan et al. (2015) stated, “women who binge drink during pregnancy are more likely to be alcohol-dependent than the average female binge drinker, and therefore binge drink more frequently” (p. 1043). The researchers emphasized that individuals generally underreport their alcohol use in surveys, and women may underreport their pregnancy status because they may not know they are pregnant.

Alcohol use among pregnant and postpartum women exists despite well-documented information that alcohol may cause birth defects; heavy consumption presents a major risk factor for the baby with considerable negative outcomes (Burns et al., 2016; Green et al., 2016; Tan et al., 2015). The infant is at risk for birth defects, including fetal alcohol spectrum disorders (FASD), developmental disabilities and growth impairments, and neurodevelopmental dysfunctions that last throughout the child’s lifespan. The pregnant mother is at risk for liver cirrhosis, cancer, violence, and possible automobile crashes (Tan et al., 2015). In the postpartum period, maternal consumption of alcohol presents further risks because of its negative impact on maternal caregiving and the mother–child relationship.

## Cannabis

Cannabis, also known as marijuana, is legal in some states, but federal law categorizes it as an illicit drug. Between 2001 and 2013, the use of cannabis has more than doubled, and the change in availability and permissiveness has likely affected its use among pregnant women (Brown et al., 2017). Pregnant mothers use it more frequently than any other illicit drug (Burns et al., 2016). In the most recent NSDUH (CBHSQ, 2016), 3.4 percent of pregnant women reported using marijuana in the past month in 2015, compared with 10.3 percent of nonpregnant women. Reportedly, some pregnant women use cannabis to treat severe nausea, yet there is not clear evidence this is effective (Roberson, Patrick, & Hurwitz, 2014). The American College of Obstetricians and Gynecologists (ACOG; 2015) recommends against using cannabis during pregnancy or while breastfeeding.

Compared with the effects of tobacco or alcohol, the effects of cannabis use during pregnancy are mixed (Brown et al., 2017; Burns et al., 2016). Increased breathing problems and poor physical and mental health are known adverse effects for the mother, but there is “a dire need for additional research on the topic” (Burns et al., p. 57). Regarding the fetus, Minnes et al. (2011) reported no association between cannabis use and significant physical abnormalities in fetal growth or development. However, Brown et al. (2017) reported a possible association between cannabis use with low birthweight and impaired neurodevelopment. A large cohort study found maternal cannabis use was linked with low birth weight when the mother used the drug regularly throughout her pregnancy (El Marroun et al., 2009). Studies of neonatal neurobehavioral development also showed “mild withdrawal symptoms and poor autonomic control, particularly of state regulation (the ability to adjust one’s level of alertness as required for a task)” (Minnes et al., p. 61).

## Cocaine

Cocaine use in pregnancy and the accompanying media attention of “crack babies” were more common in the 1980s and 1990s (Bhuvanewar, Chang, Epstein, & Chang, 2008; Forray & Foster, 2015). The most recent NSDUH (CBHSQ, 2016) data stated that 10,000 pregnant women reported cocaine use in 2014, but only 1,000 pregnant women reported using the drug in 2015, suggesting significant decreases of cocaine use among pregnant women.

The adverse effects of cocaine on the pregnant mother are known to include placental abruption, especially linked with cocaine binging; maternal seizures; premature rupture of the membranes; and preterm labor and delivery (Bhuvanewar et al., 2008). In addition, the high and crash of cocaine use can lead to the mother’s irritability and discomfort, addictive cravings, depression, and migraine headaches. Cocaine-induced hyperthermia can lead to delirium and other altered mental states, which should be “managed aggressively” (p. 61).

The effects of cocaine on the child are associated with the timing of exposure on the developing fetus; decreased head circumference and short-term memory deficits have been linked to cocaine exposure in the first trimester (Forray & Foster, 2016). Meyer and Zhang (2009) reported preliminary findings on how fetal cocaine exposure can affect the developing heart. Other studies have examined cocaine exposure on the child’s cognitive, language, and motor

development. The mixed and inconsistent findings of these studies are likely related to the “compounding effects of the postnatal environment, including dysfunctional parenting and unstable and chaotic home environments, and frequent polysubstance use in the mother” (Forsay & Foster, 2016, p. 6).

### **Methamphetamine**

A synthetic stimulant, methamphetamine is often linked with polysubstance use and co-occurring psychopathology (Forsay & Foster, 2015; Wright, Schuetter, Fombonne, Stephenson, & Haning, 2012). A longitudinal study of 131 women who used methamphetamine during pregnancy found the women were “more likely to have multiple, intertwined psychosocial risks that may result in maladaptive parenting and caregiving” (Derauf et al., 2007, p. 287). The women had low perceptions about the quality of their lives, increased legal difficulties, families and social systems where substance use was the norm, and increased probability of developing a substance use disorder.

The drug’s prevalence in pregnancy currently is estimated to be 0.7 to 5.2 percent, but overall, it is reported to be “the fastest growing illicit drug worldwide” (Forsay & Foster, 2015, p. 7). The drug’s physical effects on the pregnant mother include gestational hypertension, preeclampsia, and risk of miscarriage and intrauterine fetal death. The infant is at risk for lower birth weight when exposed during the first trimester.

### **Opioids**

The use of heroin and prescription opioids used to relieve pain expanded substantially in the past decade across the United States. Opioid use during pregnancy increased between 2000 and 2009 from 1.19 to 5.63 per 1000 live births per year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016). The major side effects of opioid use for pregnant women include significant risk of toxemia, respiratory complications, and bleeding and mortality in the third trimester (Forsay & Foster, 2015). The pregnant mother also is at high risk for accidental overdose, since prescription opioid overdose has the highest mortality rate of all drugs in the United States (McHugh et al., 2014).

The infant is at increased risk of low birthweight, postnatal growth deficiency, microcephaly, neurobehavioral problems, and SIDS. Intrauterine-exposed infants have major risks due to withdrawal from the drug after birth, developing neonatal abstinence syndrome (NAS) or, as it is now called, neonatal opioid withdrawal syndrome (SAMHSA, 2016). NAS affects 45 to 94 percent of exposed infants and leads to “increased irritability, hypertonia, tremors, feeding difficulties, emesis, loose stools, seizures, and respiratory distress” (Forsay & Foster, 2015, p. 8).

### **Polysubstance Use and Psychiatric Comorbidity**

Polysubstance use and psychiatric comorbidity in pregnancy are common, confounding the challenges and outcomes for the mother and child (King, Duan, & Amaro, 2015; Wright et al., 2012). Reportedly, “polysubstance use is as high as 50 percent in some studies” (Forsay, 2016, p. 3), and combining drugs intensifies the negative effects for the mother and child.

Depression and substance use are especially intertwined (Forray, 2016; King et al., 2015). Pregnant women with depression are at increased risk of consuming alcohol or other substances, while pregnant women who use substances are more likely to develop postpartum depression (Chapman & Wu, 2013; Vesga-Lopez et al., 2008). Up to 14.5 percent of women experience postpartum depression (PPD), which is a complicating risk factor for mothers and their newborns (Chapman & Wu, 2013). A 2002 to 2003 national survey of women ages 15 to 44 suggested that PPD also places mothers at higher risk of later substance use, compared with those without PPD. Further, infants of depressed, substance-using mothers are at increased risk of use, neglect, and possibly foster care placement (Chapman & Wu, 2013).

## Context of Treatment

The adverse effects and psychosocial risks of substance use for mothers and babies are well documented. Consequently, the American Society on Addiction Medicine recommends that “high-quality, affordable, and culturally competent SUD treatment services should be made readily available to pregnant and parenting women and their families” (Wright et al., 2016, p. 2). Yet, due to diverse priorities among the “wide range of stakeholders such as pediatrics, law, genetics, mental health, medicine, child protection, substance use, and women’s rights” (Burns et al., 2016, p. 55), debates exist regarding the policies and appropriate treatment of perinatal substance use.

For example, in 23 states and the District of Columbia, substance use in pregnancy is considered child abuse under civil child welfare provisions, with three states viewing it as grounds for civil commitment to inpatient treatment; 23 states require health care professionals to report suspected prenatal drug use, with seven states requiring drug testing (Guttmacher Institute, 2017). Further, “knowledge about effective treatment approaches for maternal substance use disorders remains poor” (Burns et al., 2016, p. 56), despite the vast body of research on perinatal substance use.

The World Health Organization (WHO; 2014) published guidelines for identifying and managing substance use and substance use disorders (SUDs) during pregnancy, based on extensive investigations of randomized controlled trials and systematic reviews. WHO guidelines for six areas of maternal and neonate care include recommendations for screening and brief interventions, psychosocial interventions, detoxification in pregnancy, pharmacological treatment for substance dependence in pregnancy, breastfeeding with maternal alcohol and/or substance dependence, and management of infants exposed to alcohol and other psychoactive substances. Though WHO graded the strength of 12 of their specific recommendations as “strong” and the other 8 as “conditional,” they rated the quality of evidence for these recommendations as “low” or “very low.”

Although policy debates and research limitations exist, substance use treatment of pregnant and postpartum women is considered “more effective than legal action and highly preferred over criminalization and incarceration to optimize maternal physical and psychological health and to improve long-term outcomes” (Wright et al., 2016, p. 1). Current reviews and empirical studies primarily highlight four areas of treatment: 1) screening and assessment of substance use; 2)

brief behavioral interventions; 3) medication-assisted interventions; and 4) psychosocial interventions, including inpatient and residential care.

## Screening and Assessment of Substance Use

Screening and assessment of substance use early in pregnancy is considered critical for effective intervention and treatment (ASAM, 2017; Bhuvanewar et al., 2008; Burns et al., 2016; Haug, Duffy, & McCaul, 2014; WHO, 2014; Wright et al., 2016). Screening tools are used to evaluate the presence of a problem such as substance use, while assessment tools evaluate the nature and severity of the problem, the particular diagnosis based on symptoms, and the appropriate treatment based on diagnosis (Haug et al., 2014).

### Screening Tools

ACOG, the American Association of Pediatrics (AAP), the American Medical Association (AMA), and the CDC all recommend that healthcare providers undertake universal substance-use screening of female patients during the first prenatal visit and at least once a trimester during pregnancy (Wright et al., 2016). Universal screening is urged because “SUDs occur in every socioeconomic class, racial and ethnic group,” and screening based only on risk factors “potentially leads to missed cases and can exacerbate stigma and stereotype” (Haug et al., p. 6). The National Institute on Drug Abuse (NIDA; 2015) provides a summary of evidence-based screening tools for adults and adolescents, including guidelines for urine drug testing for opioids and other drugs (see [www.drugabuse.gov/nidamed-medical-health-professionals/tool-resources-your-practice/screening-assessment-drug-testing-resources/chart-evidence-based-screening-tools-adults](http://www.drugabuse.gov/nidamed-medical-health-professionals/tool-resources-your-practice/screening-assessment-drug-testing-resources/chart-evidence-based-screening-tools-adults) ).

Because pregnancy is a time when women are most motivated to stop substance use, screening may build on a mother’s willingness to change for the sake of her baby (Taylor et al., 2007). NIDA (2016) has created three screening tools appropriate for assessing all forms of substance use: a one-question “Quick Screen,” the full NIDA-Modified Alcohol, Smoking, and Substance Involvement Screening Test (NM ASSIST), and an adapted NM ASSIST for adolescents (11–17). An additional three-item questionnaire that screens for alcohol use disorders is the AUDIT-C, which evaluates quantity, frequency, and impact of drinking and is used by many countries internationally (Burns et al., 2016). One limitation of these measures is the absence of validation for screening substance use among pregnant and postpartum women and the reality that women may not always be truthful in their responses.

Recognizing the importance of screening by primary care providers, ACOG (2011) recommends that all women be screened for alcohol use at least yearly and especially in the first trimester of pregnancy through the T-ACE Alcohol Use Screening Tool (Chang, Fisher, Hornstein, Jones, & Orav, 2010). Using this validated screening tool in a routine visit, healthcare providers ask about the patient’s Tolerance (“how many drinks does it take to make you feel high?”); experience of feeling Annoyed (“have people annoyed you by criticizing your drinking?”); efforts to Cut down (“have you ever felt you ought to cut down on your drinking?”); and use of alcohol as an Eye-opener (“have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?”). ACOG underscores that T-ACE is considered more sensitive

for women and minorities than the CAGE tool, often taught in medical schools, due to screening bias (see Volk, Cantor, Steinbauer, & Cass, 1997).

In addition to T-ACE, a modified version of the Institute for Health and Recovery's Integrated 5Ps Screening Tool ([www.mhqp.org/guidelines/perinatalPDF/IHEIntegratedScreeningTool.pdf](http://www.mhqp.org/guidelines/perinatalPDF/IHEIntegratedScreeningTool.pdf)) is recommended for screening all types of substances used by pregnant and postpartum women (Haug et al., 2014). This questionnaire examines the presence of drugs or alcohol use among Parents, Partner, Past, and Pregnancy (i.e., 4Ps) by asking questions about family and social networks, alcohol use in the month prior to conception, and alcohol consumption in the month prior to screening. A fifth question regarding smoking was added because women are more likely to use alcohol or drugs during pregnancy if they smoke the month prior to conception, and they are more likely to use illicit drugs, particularly cannabis, if they smoke while pregnant (Haug et al., 2014).

Three other substance-use screening tools may also be employed. First, the Fagerstrom Test for Nicotine Dependence (FTND) is a six-item tool widely recommended for screening the use of tobacco, and it can inform healthcare providers about the need for pharmaceuticals to help women stop smoking tobacco (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). Second, the Clinical Opiate Withdrawal Scale (COWS); is an 11-item scale administered by clinicians to rate symptoms and severity of opioid withdrawal, but this screening tool has not been validated for use with pregnant and postpartum women (Wesson & Ling, 2003). Third, the Severity of Dependency Scale (SDS; Alcohol and Drug Training and Research Unit, 2002) was originally designed for the screening of heroin use and "is applicable for assessing other illicit drugs including cannabis" (Burns et al., p. 58).

Finally, the 5 A's of Intervention (Ask, Advise, Assess, Assist, Arrange) is a combined screening and assessment tool recommended by NIDA (2011) for providers in general medical practices. It recommends initially screening patients using the NIDA quick screen (evaluating the past year drug use), followed by the NIDA-Modified ASSIST to determine the woman's risk level, and then a referral, including arrangements, for services. The 5 A's can be used for screening tobacco, alcohol, nonmedical prescription drug use, and other illicit drugs, including cannabis.

### Assessment Criteria and Tools

To determine the appropriate level of care for women who use substances in pregnancy, ASAM (2017) recommends that healthcare providers undertake a multidimensional assessment that covers six dimensions (see [www.asam.org](http://www.asam.org)):

- 1) Acute intoxication and/or withdrawal potential – exploring an individual's past and current experiences of substance use and withdrawal
- 2) Biomedical conditions and complications – exploring an individual's health history and current physical condition
- 3) Emotional, behavioral, or cognitive conditions and complications – exploring an individual's thoughts, emotions, and mental health issues
- 4) Readiness to change – exploring an individual's readiness and interest in changing
- 5) Relapse, continued use, or continued problem potential – exploring an individual's unique relationship with relapse or continued use or problems



- 6) Recovery/living environment – exploring an individual’s recovery or living situation, and the surrounding people, places, and things

Using the ASAM (2017) criteria, a woman’s strengths and liabilities, resources, and supports become apparent. This assessment enables the healthcare professional to determine one of the five levels of care the woman needs, including early intervention, traditional outpatient services, intensive outpatient or partial hospitalization services, residential or inpatient services, or medically managed intensive inpatient services.

To facilitate the assessment, **S**creening, **B**rief **I**ntervention and **R**eferral to **T**reatment (SBIRT) is an evidence-based tool that is frequently used to evaluate how motivated the pregnant or postpartum woman is to change and the severity of her usage (Burns et al., 2016). SBIRT measures readiness to change and has been used with pregnant and postpartum women (Haug et al., 2014; Wright et al., 2016). SBIRT provides healthcare professionals with information about the woman’s level of risk. Women are considered at “low-risk” on SBIRT assessments if they report little or no substance use prior to pregnancy and abstinence during pregnancy, and they are given brief advice about the effects of their substance use. “Moderate risk” women receive a brief intervention, but “high-risk” women are referred for more intensive specialized care, which might include pharmacological treatment and detoxification. Considered a public health approach to substance use, SBIRT is not implemented as widely as recommended, because providers often feel inadequately trained to screen for substance use, pessimistic about the woman’s motivation or capacity to change, hopeless about treatment options for substance use disorders, or in denial about the substance use of their pregnant or postpartum patients (Wright et al., 2016). Physicians and other healthcare providers interested in implementation of SBIRT can access online training at [www.sbirtoregon.org](http://www.sbirtoregon.org), a SAMHSA-funded training program established by Oregon Health and Science University (2017).

## **Brief Behavioral Interventions and Evidence of Their Effectiveness**

All pregnant women, including those assessed as low risk, should receive education and written handouts about the dangers of substance use in pregnancy (Wright et al., 2016). If a woman is screened and assessed as at “moderate risk,” she will need brief outpatient interventions, preferably through motivational interviewing (MI; Wright et al., 2016). Contingency management (CM) and cognitive-behavioral therapy (CBT) are two additional brief intervention approaches appropriate for pregnant and postpartum women using substances. These three behavioral interventions can take place in an outpatient setting such as the physician’s office or clinic, or they can be incorporated into a more intensive outpatient or inpatient treatment program.

### **Motivational Interviewing**

MI is a patient-centered form of empathic listening aimed at change through highlighting cognitive dissonance, self-efficacy, and the patient’s underlying motivation (Miller, 1983/2009). Originally created as a brief counseling approach to address problem drinking, MI has been widely incorporated into health care settings, with special emphasis on behavioral health change. For a pregnant woman, MI can motivate change by underscoring the discrepancy between her current behavior (e.g., her substance use) and her goals (e.g., her wish for

abstinence and a healthy baby). MI counseling is most effective with pregnant women when the healthcare provider is nonjudgmental, nonshaming, and explores options to address the woman's substance use (Wright et al., 2016). The provider and patient mutually agree upon a behavioral contract, followed by more frequent medical visits to monitor and support the woman's progress. A patient likely has a SUD if she is unable to keep her contract agreement and continues to use substances; she should then be referred for more intensive addiction treatment.

Several empirical studies have evaluated the effectiveness of SBIRT and MI with pregnant women who use alcohol and tobacco (Farr et al., 2014; Wright et al., 2016). Comparing brief interventions with no interventions, two randomized controlled trials showed brief interventions were effective in decreasing alcohol use in pregnancy and improved the overall outcome of the pregnancy (Chang et al., 2005; O'Connor & Whaley, 2007). Montag et al. (2015) showed brief interventions decreased pregnancies exposed to alcohol among a population of Native American and Alaska Native women. Using brief interventions to address smoking, Ferreira-Borges (2005) reported a 33 percent quit rate for pregnant women engaged in MI versus an 8 percent quit rate for the non-MI control group. MI also has shown some effectiveness in reducing cannabis use in general, but has not been tested with pregnant women specifically (Forray, 2016).

Generally positive reviews exist for the effectiveness of MI, also known as motivational enhancement therapy (MET). Yet, there is some evidence that suggests "motivational approaches may be ineffective or even counter-productive when used with persons who are already relatively motivated to change" (Ondersma, Winhusen, Erickson, Stine, & Wang, 2008, p. 74). According to Ondersma et al., there is "substantial complexity in the situations for which motivational approaches are best-suited" (p. 78).

### Contingency Management

Contingency management (CM) is a form of treatment that uses operant conditioning to influence behavioral change. Incentives, generally voucher-based financial incentives, are used to positively reinforce and support a pregnant woman's increase in abstinence and treatment retention, thereby improving her baby's birth outcomes (Foray, 2016; Higgins & Solomon, 2016). Women receive some type of award that is contingent on completing tasks related to treatment such as attending consecutive meetings, producing "drug-free" urines, or taking prescribed medications (Brigham, Winhusen, Lewis, & Kopp, 2010). Brigham et al. (2010) stated that there is no definitive cost-effectiveness size for CM incentives used in the treatment of all substances. They noted, however, "even incentives in the \$25-\$30 range or greater may be justified in view of the potential benefits and costs savings" (p. 94).

Recent randomized controlled trials support the efficacy and cost effectiveness of CM treatment, particularly for smoking cessation (Higgins & Solomon, 2016). One recent study in England found prolonged abstinence rates following CM incentives, with 1 in 5 women who quit smoking by delivery and 1 in 10 who remained abstinent 6 months postpartum (Ierfino et al., 2015). The smoking abstinence rates for women receiving CM in this study were greater than

women in the control group, and this research was the first study to incorporate financial incentives through a community treatment setting (Higgins & Solomon, 2016).

A systematic review of 14 randomized controlled trials comparing CM, MI, and psychosocial interventions with control groups found 9 studies with 704 participants used CM as the intervention for substance use treatment with pregnant women (Terplan, Ramanadhan, Locke, Longinaker, & Lui, 2015). In the CM intervention group, neonates were in the hospital for a shorter time after delivery, compared with other intervention groups, suggesting the effectiveness of CM for treatment of this population. CM also has shown the most success supporting prenatal cocaine cessation (Foray, 2016).

### **Cognitive-Behavioral Therapy**

CBT is an empirically validated psychotherapeutic approach that addresses the thoughts, feelings, and behaviors related to a particular problem. In substance use treatment, the goal of CBT is to change the behavior of substance use by replacing destructive patterns of behavior and thoughts with new and more productive ones (Forray, 2016). CBT is a popular approach that has been effective with a wide range of populations, including individuals who use substances and women who experience both perinatal and postnatal depression (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). However, limited research has evaluated CBT as a substance use treatment for pregnant women (Terplan et al., 2015).

In a randomized controlled trial with 168 substance-using women, Yonkers et al. (2012) tested CBT, coupled with motivational enhancement therapy (CBT–MET), against a control group of women given brief advice by obstetrical clinicians. The study found no significant differences in the outcomes of the two intervention groups. Both CBT–MET and brief advice were suitable for pregnant women in reducing their use of illicit drugs and alcohol, but there was no evidence that CBT was a superior treatment approach.

### **Medication-Assisted Interventions**

When brief behavioral interventions prove ineffective for pregnant and postpartum women with SUDs, pharmacological interventions or intensive psychosocial treatment programs are needed. To date, however, few medication-assisted treatments are safe during pregnancy, and effective interventions are limited to the treatment of cocaine and opioids. No evidence-based pharmacological interventions for cocaine use disorder (CUD) currently exist (Forray & Foster, 2015). However, in a recent pilot study, Yonkers et al. (2014) found support for the use of progesterone in postpartum women with CUD. The researchers concluded that using “progesterone as a treatment strategy for postpartum women has appeal because it allows women to build on a period of natural abstinence or attenuated cocaine use that often occurs in pregnancy” (p. 22).

Medication-assisted treatments (MATs) are recommended for opioid use disorder (OUD), which includes use of both heroin and prescription opioids. According to Forray and Foster (2015), “Methadone maintenance is considered the standard of care for pregnant women with opiate use disorder” (p. 8). Studies show that methadone provides “superior relapse prevention...reduced risk-taking behavior, enhanced compliance with prenatal care, and better

neonatal outcomes” (p. 8). In contrast, Jones et al. (2010) suggested buprenorphine may be a preferred alternative to methadone treatment in pregnant women, due to symptom reduction for neonates born with NAS. Although buprenorphine yielded shorter stays in the hospital for neonates, there was less treatment adherence by the women taking buprenorphine. Yet, Jones et al. (2010) stated that buprenorphine “should be considered a first-line treatment option in pregnancy” (p. 2330).

In a recent review of trials of buprenorphine versus methadone or a placebo (Mattick, Breen, Kimber, & Davoli, 2014), researchers concluded that delivery of buprenorphine at fixed doses (7 mg per day) and methadone at fixed doses (40 mg or more per day) was equally effective for pregnant and postpartum women in retaining individuals in treatment and in reducing illicit opioid use. Both prescribed medications are approved by the FDA and recommended for medical treatment with pregnant and postpartum women with OUD, especially in combination with brief behavioral interventions such as SBIRT and CM (SAMHSA, 2016, 2017). However, “any medication given to pregnant women should be prescribed only after considering the risk: benefit ratio for the maternal-fetal dyad” (Jones, Finnegan, & Kaltenbach, 2012, p. 747).

## Psychosocial Interventions

Pregnant and postpartum women often need psychosocial interventions to address their substance use, in addition to screening and assessment, brief behavioral interventions, and pharmacological interventions. Many require comprehensive case-management services to lessen existing barriers to recovery, provide emotional support, and facilitate attendance in outpatient treatment (Haug et al., 2014). Mothers may need a range of assistance such as housing, transportation, childcare, and employment services. Pregnant women who have substance use disorders may benefit most from programs that provide more intensive levels of care such as intensive outpatient treatment, residential, or inpatient treatment (Haug et al., 2014).

## Intensive Outpatient Treatment

Intensive outpatient treatment programs offer multidimensional services and a higher level of care, providing women between 9 to 30 contact hours per week, in place of traditional outpatient treatment (Haug et al., 2014). Outpatient treatment programs include medical services, health promotion, psychoeducation, gender-specific services, cultural and language-appropriate programming, life skills training, family-related and child-related services, comprehensive case management, disability services, and mental health services, including trauma-informed and trauma-specific services (Center for Substance Abuse Treatment, 2009). Most intensive outpatient programs incorporate one or more brief behavioral interventions.

*Partnering for the Future* is an intensive outpatient treatment intervention designed “to provide optimal access and comprehensive care to mothers with substance use disorders and their babies” (Gibbons et al., 2010, p. 2). Based at the University of Michigan high-risk obstetrics clinic, the program offers every pregnant participant an obstetrical and nursing evaluation, social work needs assessment, and an initial addiction and psychiatry evaluation. Women are referred to substance use treatment and/or psychotherapy and receive urine drug screens at every visit. Reportedly, most of the women attending the clinic are identified with

polysubstance use and/or dependency. In addition to substance use treatment, the women in this program receive weekly supportive counseling and participate in a 12-week postpartum group that begins 4 to 6 weeks after delivery.

*Family Spirit* exemplifies an intensive, outpatient treatment program that covers teens during pregnancy through the first 36 months postpartum (Barlow et al., 2013). This program is a culturally tailored, comprehensive home-visiting program for American Indian teenage mothers (ages 12 to 19). It focuses on reducing the mother's drug and alcohol use, as well as increasing parenting competence, maternal self-efficacy, and healthy infant-toddler emotional and social adjustment. Evaluation of the program's effectiveness showed mothers had fewer externalizing behaviors at 12-months postpartum. Findings suggested that Family Spirit improves parenting and predicts lower lifetime behavioral and drug-use risk.

### **Residential and Inpatient Treatment**

Residential treatment is indicated when women have multiple complex needs and require a safe and structured environment for their recovery (Center for Substance Abuse Treatment, 2009). Residential care takes place in a variety of settings, including halfway houses, inpatient programs, and recovery homes. Specialized care for pregnant women in residential care includes prenatal care, nutrition services, transportation to obstetrics appointments, childbirth education, mental health services, and education about alcohol and drug use specifically related to pregnancy (Haug et al., 2014).

Federal law requires that substance-use treatment programs give admission priority to pregnant women, allowing them to bypass waiting lists and gain admission when a bed becomes available (Center for Substance Abuse Treatment, 2009). Substance use, obstetrical, and pediatric care providers must collaborate closely in these circumstances. SAMHSA's Center for Substance Abuse Treatment (CSAT) currently provides funding for residential substance use treatment for pregnant and postpartum women and infants, with a focus on low-income women and their minor children who have limited access to quality health services (SAMHSA, 2014). These programs support evidence-based parenting and treatment models, including trauma-specific care, and allow the mother to live with her newborn after delivery.

*Arkansas CARES* is one example of a comprehensive, residential care treatment program for mothers and their children (Connors, Bradley, Whiteside-Mansell, & Crone, 2001). This program provides substance use prevention and treatment for low-income expectant mothers and their children; it is licensed to provide alcohol and drug treatment, adult and child mental health, childcare, and early intervention through multidisciplinary teams. Overall, an evaluation of 305 women who received residential treatment in this program showed positive outcomes in a number of areas (Connors, Grant, Crone, & Whiteside-Mansell, 2006). Half the participants were completely abstinent from alcohol and drugs at final follow up, made gains in self-sufficiency and increased employment, and saw improvements in their mental health and parenting attitudes. The research also suggested that longer treatment stays were linked with more positive outcomes. Similarly, a review of residential programs nationwide found treatment success rate ranged from 68 to 71 percent among women who stayed in treatment programs 6 months or longer, but rates were lower for shorter stays (Greenfield et al., 2004). In

sum, the effectiveness of residential treatment appears linked to the length of the treatment itself.

The substantial increase in opioids over the past decade and easy transfer of opioids across the placenta have led to increased needs for residential or inpatient treatment for pregnant mothers who use opioids. Reportedly, newborns born with NAS have increased threefold in the United States and they “are in need of long, often medically complex and costly, hospitalizations” (Haabrekke et al., 2014, p. 114). Due to the withdrawal symptoms and neurodevelopmental deficits experienced by newborns with NAS, some residential programs have been established as alternative treatment options to outpatient opioid-maintenance treatment, the customary treatment for pregnant women who are dependent on opioids.

In 2012, Norway’s legislature passed an act requiring that pregnant women with substance dependence must receive treatment. Women may voluntarily (or involuntarily) receive traditional outpatient opioid medication maintenance therapy, be hospitalized for detoxification, or stay in a residential care facility for detoxification and additional services. Haabrekke et al. (2014) evaluated differences in the outcomes of neonates based on the mother’s opioid treatment. In residential care, detoxification occurred and was maintained with close monitoring in a supportive setting throughout the pregnancy. Children born to mothers detoxified in residential treatment, compared with mothers not detoxified during pregnancy, revealed “significant differences in perinatal outcome” (p. 119). The gestational age and head circumference of the neonates were larger in the residential group, and there were no miscarriages, birth complications, or morbidities associated with residential detoxification.

## Barriers to Recovery

Women who use substances during pregnancy and the postpartum period face a number of barriers to recovery, in addition to the medical risks to mother and child. Families and partners, in particular, can be significant sources of support for the pregnant or postpartum mother in both screening and treatment, but conversely, they can negatively influence and undermine her, serving as major barriers to her recovery (Center for Substance Abuse Treatment, 2006). Other external barriers to care often include inadequate housing, employment, transportation, childcare, and healthcare. These external barriers leave women “vulnerable to the many negative factors that may ultimately lead to relapse. The cycle of negative consequences may begin again, not only for mothers but children as well” (Connors et al., 2001, p. 75). A system-wide challenge is that few states have the policies or funding to address these barriers or to aid in ongoing recovery.

Healthcare provider bias against pregnant women who use substances is another external barrier, influenced by the reality that some states criminalize the use of substances during pregnancy. “Pregnant women who abuse substances are the most likely group to be stigmatized and treated punitively for their addiction-related behavior” (Crawford, Sias, & Goodwin, 2015, p. 4). Some women are afraid to seek treatment because they may face charges of “‘chemical endangerment of a child,’ a Class A felony that carries a mandatory sentence of 10 years to life” (p. 2). Even in states where substance use in pregnancy is not criminalized, pregnant women

who use substances face stigma and the fear they will lose custody of their children (Calhoun, 2012).

Shame and, often, depression are major internal barriers women face when they use substances while pregnant. Many pregnant women with substance use disorders have histories of trauma, and women exposed to sexual abuse while pregnant tend to have more severe drug problems (King et al., 2015). These compounding problems make it more challenging for women to seek help. Pregnant and postpartum women who use substances also have more social vulnerability than nonpregnant women, as measured by income and employment. Research shows that social vulnerability is high among women who have co-occurring trauma and substance use disorders, especially among racial and ethnic minorities (King et al., 2015).

The external and internal barriers faced by pregnant and postpartum women intersect with systemic challenges at the national, state, tribal, and community level. Review of the literature suggests that substance use treatment is insufficient, and more residential facilities designed exclusively for pregnant and postpartum women and their infants and children are necessary (Ashley, Marsden, & Brady, 2003). Further research is needed to evaluate the effectiveness of this treatment, particularly regarding the benefits to the developing child and the mother–child relationship.

Literature further supports the need for integrated care, combining “mental and behavioral health services with physical health services for primary and prenatal care” (King et al., 2015, p. 186). This is particularly needed for pregnant and postpartum women with co-occurring disorders and postpartum depression. Mandated, integrated treatment would address the needs of mothers more effectively, and it would decrease the short-and long-term cost to society (King et al., 2015).

Finally, research supports the importance of collaboration to effectively provide substance use treatment and especially address the current public health challenge of opioid use (SAMHSA, 2016). Cross-disciplinary teams should include the mother’s medical and behavioral healthcare providers, the infant’s medical healthcare providers, child welfare, and dependency courts, as well as the substance treatment team (Marsh & Smith, 2011; SAMHSA, 2016). Better collaboration between child welfare and the medical community, in particular, could minimize the challenges that pregnant mothers face and increase the likelihood of longer-lasting recovery by treating the family system through a supportive and caring manner.

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