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**Substance Use Best Practice Tool
Guide**

**WOMEN IN GENERAL/ OF
CHILDBEARING
POTENTIAL/PREGNANT WOMEN**

Division of Clinical Leadership in Collaboration with the
Division of Substance Abuse Services

Women's Issues

Women in General/Of Childbearing Potential

Over the years, research on how gender affects substance use and related problems has established distinct differences between women and men in several important areas. Women often drink alcohol less frequently, consume less alcohol than men when they drink, and are less likely to develop alcohol-related problems than men. There have been similar findings distinguishing women and men in their use of illicit drugs and development of drug-related problems. On the other hand, when women develop problems with substance use, they tend to do it faster than men. Women also tend to report more severe problems and experience more health-related consequences from substance use than men. Furthermore, women's substance-related problems interfere with functioning in more life domains compared to men (Green, 2006). Facts around women and substance use are not favorable. For example:

- Women may respond to substances differently, e.g., they may have more drug cravings and be more likely to relapse after treatment.
- Women use substances differently than men, such as using smaller amounts of certain drugs for less time before they become addicted.
- It appears that women who use drugs may also experience more physical effects on their blood vessels and heart.
- Sex hormones may make women more sensitive than men to the effects of some drugs.
- It appears women may be more likely to go to the emergency room or die from overdose or other effects of certain substances.
- Women who are victims of domestic violence are at increased risk of substance use.
- Loss of child custody, divorce, or the death of a partner or child can trigger a woman's substance use and/or other mental health disorders (NIDA, 2015).

Women frequently report that negative affect, stress, and relationships precipitate initial use of substances. Many times, they are introduced to substance use through a significant relationship such as a family member, boyfriend, or close friend. Family of origin characteristics also play a role in women's use of substances, as is exposure to argumentative, chaotic, and violent households or being expected to take on adult responsibilities as a child. Women with substance use disorders (SUDs) are more likely to have partners that have a SUD. The shared drug use with the partner tends to be perceived as a way of connecting to or maintaining the relationship. Being a woman with a marital status of separated, never married, or divorced operates as a risk factor for development of a SUD while being married appears to be a protective factor (SAMHSA, 2013).

Getting women into treatment or retaining them in treatment is often arduous because women are usually the primary caregivers for their children and/or other family members. Moreover, many

women are very fearful that they will lose their partner if they enter treatment, even more so than during treatment. Getting women to own the substance use problem is difficult because they are afraid they will lose custody of their children. They worry that they will be perceived as ‘bad mothers’ if they admit to having a SUD. Of course, these stereotypes and fears compound the woman’s shame and guilt about substance use and substantially interfere with any help-seeking behavior (SAMHSA, 2013).

Cultural issues may also interfere in a woman’s help-seeking behavior. Women for whom English is not their primary language may be concerned about language difficulties. Asian women may have difficulty engaging in mixed gender groups due to the value place upon patriarchal family hierarchy, gender role expectations, and male offspring. African American/black and American Indian women tend to have a general mistrust of treatment services and will likely not engage in treatment (SAMHSA, 2013).

Gender differences in rates of substance use have been consistently observed in the general population and treatment-seeking samples, with men exhibiting significantly higher rates of substance-related problems. Recent epidemiologic surveys, however, have suggested that the gap between men and women has narrowed in recent decades. For instance, surveys from the early 1980s estimated the male/female ratio of alcohol-use disorders as 5:1; more recent surveys report a ratio of approximately 3:1. Several studies have also indicated that rates of nonmedical prescription drug use are higher among women than men, particularly for narcotic pain relievers and tranquilizers (Greenfield, Back, Lawson, & Brady, 2010).

Among women of childbearing potential, 20 percent of between the ages of 15 and 17 used illicit substances in the past month. In fact, the rates of alcohol consumption by women of childbearing potential are approaching those of men (Chang, 2014). Thus, it is imperative that we have conversations with women about substance use, especially women of childbearing potential. Experts say all women of childbearing potential should be screened periodically for substance use, including alcohol and tobacco use, in addition to use of licit and illicit substances (Wong, Ordean, & Kahan, 2011; WHO, 2014). The American Medical Association (AMA) has endorsed universal screening and health services researchers found that treatment of women for substance use/misuse saves \$7 for every dollar spent (ACOG, 2008). SBIRT screening procedures, as discussed in the *Prevention/Early Intervention* module, is a quick and easy way to proceed with the screening process. This screening will assist in identifying women of childbearing potential who are using substances at risky levels and allow for the provision of an intervention plan (SAMHSA/HRSA/CIHS, 2013).

Because of the specific needs of women, in particular those of childbearing potential, treatment services must be tailored to their needs and address the unique hardships they often encounter in engaging treatment. Promising practices include comprehensive and integrated clinical and community services that, under ideal circumstances, would be delivered at a one-stop location. Hence, the following services need to be available for women: medical services, health promotion, psychoeducation, gender-specific needs, cultural/language needs, life skills, family/child-related services, comprehensive case management, mental health services, disability services, and staff/program development (SAMHSA, 2013).

Pregnant Women

Pregnancy is a significant concern in treating women of childbearing potential who have a SUD (SAMHSA, 2013). Maybe the pregnancy was planned; maybe it was not. Nonetheless, pregnancy can be a very stressful time for the mother and her unborn child. Expectant mothers are encouraged to do all they can to keep themselves and the developing fetus as healthy as possible throughout the pregnancy. Hence, there is much to think about—what to eat, how much sleep is needed, etc., as well as much to remember to do to ensure the child's well-being is met. Everything that the

The woman who is pregnant must watch everything she puts into her body (American Pregnancy Association, 2014).

expectant mother eats, drinks, takes, or injects will affect the fetus (NIH/NIAAA/NOFAS, 2012). Similarly, everything that the expectant mother fails to do well such as get the required amount of sleep, keep prenatal appointments, etc., will affect the fetus.

The woman who is pregnant must watch everything she puts into her body (American Pregnancy Association, 2014). Specifically pregnant moms should abstain from any substance use, including alcohol, during pregnancy (NIH/NIAAA/NOFAS, 2012). Even if a previous pregnancy involved substance use and the newborn was healthy, the pregnant mom should not push her luck. Each pregnancy is different and this time the substance use could result in a newborn with serious problems (NIH/NIAAA/NOFAS, 2012).

Most often, drug use does not begin during pregnancy. Women enter pregnancy already using or dependent on drugs (Prasad, 2014). It has been reported that approximately 50 percent of women takes at least one medication during pregnancy (mothertobaby.org, 2015). Many of those medications are for preexisting and chronic conditions such as autoimmune disease or asthma and may need to be taken continually through the pregnancy or while breastfeeding (mothertobaby.org, 2014). Moreover, research shows that women between the ages of 18 and 29 are at highest risk for developing addictive behaviors. These data are especially telling because the ages of greatest risk fall during the peak reproductive years. A study at two large hospital-based, inner-city, primary care prenatal clinics reported screening results related to their use of alcohol, cigarettes, illicit drugs, and other related emotional health problems. Nearly 50 percent (around 1,300) had a history of substance use and slightly more than 10 percent indicated current use. Those who used substances tended to be in their mid-twenties, with three as the average number of prior pregnancies. Educational level was fairly evenly spread, though only about 30 percent reported education or training beyond high school (Howell, Shao, & Yonkers, 2010).

Compared to other women of childbearing potential, research suggests that pregnant women tend to use alcohol and other substances to a lesser degree. However, pregnant women often use substances in combination (BSAS, 2011). Over the last few years, substance use during pregnancy has become a major public health concern in the United States, which makes pregnancy a very strategic time to address maternal substance use (Forray, 2016). The American College of Obstetricians and Gynecologists [ACOG] (2011) has recommended that all pregnant women be asked about alcohol and substance use. Moreover, every effort should be made to encourage pregnant women to receive prenatal care, particularly if they are users of alcohol and/or other substances. Babies born to women who have received no prenatal care and are users of illicit substances are at highest risk of being premature and low birthweight (El-Mohandes, Herman, El-Khorazaty, Katta, White, &

Grylack, 2003). Yet these risks decrease substantially as mothers move toward receipt of an adequate level of prenatal care (El-Mohandes et al., 2003; Racine, Joyce, & Anderson, 1993). Of course, the least amount of risk is associated with not using substances during pregnancy in conjunction with obtaining adequate prenatal care (El-Mohandes et al., 2003).

Women who use and/or misuse substances are at higher risk of depression during pregnancy and at increased risk of violence during the postpartum period (BSAS, 2011.) However, substance use and/or misuse during pregnancy frequently remains under-diagnosed or undiagnosed (Keegan, Parva, Finnegan, Gerson, & Belden, 2010). While many pregnant women that use substances do not seek prenatal care, they may seek help with their addiction, especially opioid addiction, through replacement therapy

involving methadone or similar medications.

Sometimes women on certain opioid replacement medication who have

Many women who use/misuse substances during pregnancy are polydrug users (Forray, 2016; Nelson, 2013).

become pregnant have been encouraged to remain on the medication to avoid miscarriage. It should further be noted that many women who use/misuse substances during pregnancy are polydrug users, combining methadone and other narcotics, a fact that may not be known to the health care professional until delivery of the infant. This fact creates many challenges for health care personnel (Forray, 2016; Nelson, 2013).

Use of multiple drugs is particularly dangerous to fetal development. One drug can unpredictably and seriously change the bioavailability (rate at which the drug enters the blood stream), concentration, and net effect of any other drugs. Alternately, the combination of drugs can possibly form a metabolite more toxic than any of the parent compounds. These changes can be created by over-the-counter medications as well as licit and illicit drugs in use. For example, aspirin, Tagamet, and Zantac—common over-the-counter medications—interact with alcohol metabolism leading to a higher level of blood alcohol concentration (BAC). The BAC levels for a given dose of alcohol are known and predictable. BAC levels for any added drugs, on the other hand, affect alcohol metabolism in an unpredictable manner. For example, studies involving the combination of alcohol and cocaine have shown the interaction to be more harmful than the use of either drug independently. The combination results in the formation of a highly toxic metabolite cocaethylene. Surviving infants of mothers who co-used/misused alcohol and cocaine have shown serious neurobehavioral deficits (Chen & Maier, 2011).

Women who are pregnant might use and/or misuse prescription medications and the United States Food and Drug Administration (FDA) has beefed up its labeling requirements. The final rule requires that prescription drugs and biological products include more detailed labeling about their risks during pregnancy and breastfeeding. Pharmaceutical companies are further required to ensure

New labels on prescription drugs and biological products include more detailed information about their risks during pregnancy and breastfeeding (mothertobaby, 2014).

labels detail risk information about the medications, along with relevant research specific to pregnancy and breastfeeding. In addition, the new labels will have a dedicated section on the impact of a drug on breast milk and the medication's potential impact on fertility, birth control and relevant pregnancy registry information (FDA,

2014a, 2014b; Gaffney, 2014; mothertobaby, 2014). This new labeling went into effect on June 30,

2015 (FDA, 2014a). The Organization of Teratology Information Specialists (OTIS) is one of a number of organizations that will assist health care providers and the general public in understanding the new labels (mothertobaby, 2014).

Screening

Often providers of prenatal care hesitate to implement screening procedures because they assume urine toxicologies to be the most appropriate screening methodology. However, there are other screening tools that can be effective in exploring substance use by pregnant women. Moreover, urine toxicologies are limited in the information they can provide about alcohol use and further limit identification of illegal drug use if use occurred within 48 hours of testing. The 4P's Plus screen broadens detectability and provides an opportunity for early intervention for the much larger group of women who have risky pregnancies due to relatively small amounts of substance use (Chasnoff et al., 2005). It incorporates five questions specifically designed to quickly identify whether pregnant women need follow-up monitoring or in-depth assessment. The screen takes less than a minute and can easily be integrated into the initial prenatal visit and used for follow-up screening throughout the pregnancy. (The tool can also be used to identify women with risky drinking patterns before they learn their pregnancy.) If the screen is positive but the assessment is negative (i.e., the woman has stopped drinking now that she knows she is pregnant), she can receive an appropriate intervention, education, and/or information with a strong prevention message along with cautions about the impact of even low levels of alcohol use during pregnancy. Brief intervention strategies have been integrated into the screening process since 2000. This package is proprietary. The screener itself is available for purchase from NTI Upstream at <http://www.ntiupstream.com/4pspricing>.

The Institute of Health and Recovery's (IHR's) 5 P's Behavioral Risk Screening Tool, was specifically designed for pregnant women. Based on Dr. Hope Ewing's 4 P's instrument, the tool is in the public domain and includes questions about peers and smoking. The screener also has a trauma focus, including questions about emotional health and violence. A positive screen involves a single positive answer to PARENTS, PARTNER, or PAST use, despite negative responses that may be provided to the PRESENT and PEERS questions. The IHR 5 P's Behavioral Risk Screening Tool is available in the Screening Tools module of this document in the Appendices, along with other screening tools. Clinicians are instructed to ask all 5 P questions to better assess risk, motivation to change, and relational impacts of abstinence from substance use during pregnancy (Watson, 2010). Caring for the pregnant woman affected by substance use should further include prenatal screening and monitoring for sexually transmitted diseases (STDs) at the initial visit and at week 36, along with appropriate treatment as necessary (Bhuvaneswar et al., 2008).

Alcohol Use during Pregnancy

All advisories warn against (alcohol) use in any amount by pregnant women (e.g., CDC, 2005)

It has only been since the second half of the 20th century that the negative consequences of alcohol use during pregnancy have been known (Kvigne, Leonardson, Borzelleca, & Welty, 2008; Warren,

Hewitt, & Thomas, 2011). In the late 19th century, physicians prescribed alcohol to reduce morning sickness and the difficulties of childbirth for pregnant women. By the 1940s, it was believed that alcohol use during pregnancy was not harmful to the fetus. Alcohol has also been used by physicians to delay the onset of labor (Kvigne et al., 2008). In fact, the concept of FAS did not exist before 1973 (Golden & Finkel, 2005). However, the detrimental effects of alcohol use during pregnancy are now known and all advisories warn against use in any amount by pregnant women (CDC, 2005; Ismail et al., 2010).

No amount of alcohol is safe, especially for the developing fetus (Ismail, Buckley, Budacki, Jabbar, & Gallicano, 2010, e.g.).

Health care experts advise that no amount of alcohol is safe, especially for the developing fetus (Ismail, Buckley, Budacki, Jabbar, & Gallicano, 2010; NIH/NIAAA, 2015). Moreover, there is no formula for

determining which alcohol-exposed newborns will develop a fetal alcohol spectrum disorder (FASD) (Woods, Greenspan, & Agharkar, 2011). This means that any woman who is sexually active, not using effective birth control, and who consumes alcohol is at potential risk for having a child with FASD (Ismail et al., 2010; WHO, 2014). (FASD is discussed in greater detail in its own module of these guidelines.) Research has also shown that newborns exposed primarily to alcohol in utero demonstrated significant risk of being born of low birth weight, compared to newborns exposed to other types of substances (Irner, Teasdale, Nielsen, Vedal, & Olofsson, 2012). ***Therefore the best preventive strategy is complete abstinence from alcohol by any woman even thinking about the possibility of becoming pregnant*** (Woods et al., 2011).

Nevertheless, some reports indicate between 15 and 25 percent of pregnant women continue to consume alcohol monthly.

Moreover, five to ten of 1,000 pregnant women consume, on average, at least seven drinks weekly.

In addition to the damaging effects

alcohol consumption can have on the

developing brain of the fetus, research has found that alcohol consumption during pregnancy can also increase the risk of infection in newborns (about.com, 2013).

The best preventive strategy is complete abstinence from alcohol by any woman even thinking about the possibility of becoming pregnant (Woods et al., 2011).

In general, binge drinking with periods of abstinence mixed with heavy acute drinking results in greater health implications than continuous moderate drinking (Nuñez, Roussotte, & Sowell, 2011; Woods et al., 2011). (Heavy drinking involves at least five drinks on the same occasion on each of five or more days in the past 30 days while moderate drinking is up to one drink per day for women [NIAAA, n.d.]). Older women (in their 30s and 40s) may be more likely to drink during pregnancy (Wilsnack, Wilsnack, & Kantor, 2013).

An eight-state study by Ethen and colleagues identified binge drinking prior to pregnancy as a predictor of drinking and/or binge drinking during pregnancy. Moreover, drinking and/or binge drinking was more prevalent among White, non-Hispanic women whose pregnancy was not planned and who also smoked during pregnancy (Wilsnack et al., 2013).

One extensive review of studies has reported that being African American and American Indian/Alaska Native, a smoker, and of low socioeconomic status (SES) were common

characteristics of women giving birth to a child with fetal alcohol syndrome (FAS). Additional studies have identified more common factors, including being unmarried, under psychological stress, having mental health disorders, having a history of sexual or physical abuse, and having a history of current or previous illicit drug use (CDC/NCBDDD, 2004). (Further discussion of the impact of alcohol use on a prenatally exposed fetus can be found in the module on *Fetal Alcohol Disorder Syndrome* in this document.)

In many instances, it is during a woman's use and/or misuse of alcohol that conception occurs. Moreover, many women continue drinking casually in their first trimester, the time when fetal organ systems are beginning to develop (Keegan et al., 2010). Other realities are the fact that more than 50 percent of pregnancies in the United States are not planned and many women are not aware of their pregnancy for up to four to six weeks (CDC, 2014). However, women should abstain from any alcohol consumption during pregnancy because of the possible risks to the fetus that will be lifelong (CDC, 2005; Ismail et al., 2010). If drinking and pregnant, the woman should stop immediately. *It is never too late to stop* (CDC, 2014).

Women of color, especially African American women, are less likely to drink during their first pregnancy than their White counterparts. Other factors linked to drinking behaviors in pregnant, first-time mothers include having attended some college, feeling pushed around, delayed prenatal care, and having no feeding plan for the baby (O'Brien, 2012).

Maternal alcoholism is one of the most preventable causes of fetal neurodevelopmental disorders (ACOG, 2008).

Alcohol use/consumption levels in advance of pregnancy have shown to be a strong predictor of use/consumption

during pregnancy (Floyd, Weber, Denny, & O'Connor, 2009). Additionally, there is still concern that identification and assessment of alcohol use by women does not occur routinely in primary care settings (Clarren & Salmon, 2010). Yet maternal alcoholism is one of the most preventable causes of fetal neurodevelopmental disorders (ACOG, 2008).

Alcohol exposure during pregnancy is highly associated with insecure attachments between newborns and mothers. Exposure may further impact school performance, especially mathematics. Exposure to alcohol in utero seems to affect academic achievement even after controlling for intellectual ability (i.e.,

IQ). A study by O'Connor and colleagues observed higher levels of attachment security and better coping skills when frustrated for children exposed to alcohol in utero and their mothers

Prevention strategies implemented in advance of conception provide the greatest opportunities for healthy pregnancy outcomes (Floyd, Weber, Denny, & O'Connor, 2009).

were supportive emotionally. The former group was compared to exposed and unexposed children with unsupportive mothers (NAIARC, 2012).

Prevention strategies implemented in advance of conception provide the greatest opportunities for healthy pregnancy outcomes for women at risk of hazardous alcohol use. Early prenatal care is often

too late for many women and newborns because half of the pregnancies are unplanned. This means that substance use during pregnancy has already occurred. Hence, evidence-based interventions should be implemented before conception. Alcohol-exposed pregnancies can best be reduced by providing brief behavioral interventions and counseling regarding effective contraceptive options when not planning a pregnancy (Floyd et al., 2009).

Three medications have been approved by the United States Food and Drug Administration (FDA) in the treatment of alcohol use disorders (AUDs): disulfiram, acamprosate, and naltrexone (oral and extended-release injectable), all of which are discussed more extensively in the Medication – Assisted Treatment subsection of the *Evidence-Based Treatments* module. Counseling and other supports are part of the medication-assisted treatment (MAT) package (Douaihy et al., 2013; SAMHSA/CSAT, 2009).

Cocaine Use during Pregnancy

Cocaine, referred to as the “wonder drug” in its early years of appeal in the United States, was originally freely available in saloons, from mail-order vendors, and even in grocery stores. It was often included in soda pop and some wines before its ill effects were known. President William Taft identified cocaine as “Public Enemy No. 1” and Congress, in 1914, passed the Harrison Act, tightly regulating the distribution and sale of the drug. Its appeal declined dramatically by the late 1950’s, but soon reappeared in the 1960’s (Das, 1993).

Cocaine is a powerful stimulant of the central nervous system. Recreational use is typically by injection, inhalation, or through smoking the cocaine derivative “crack”. As true for alcohol consumption during pregnancy, researchers do not know how much cocaine it takes to cause birth defects and/or other adverse outcomes for an exposed fetus. Hence, it is recommended that any amount or form of cocaine be avoided during pregnancy (OTIS, 2014a).

It is recommended that any amount or form of cocaine use be avoided during pregnancy (OTIS, 2014a).

A majority of mothers who use cocaine during pregnancy additionally use other substances such as marijuana, cigarettes, and alcohol (Eiden, Granger, Schuetze, & Veira,

2011). Spontaneous abortion can occur if cocaine is used during the early months of pregnancy. The incidence of stillbirth for pregnant mothers that used/misused cocaine was elevated eight percent about the expected level when compared to the general population. Preterm rupture of membranes, preterm labor, and preterm delivery are also associated with cocaine use during pregnancy. Further, cocaine use curbs the appetite of the pregnant woman, thereby contributing to poor maternal and fetal nutrition (Keegan et al., 2010).

There are no specific verbal screening instruments for illicit substance use in pregnancy as exist for alcohol use. Neither the CAGE-AID nor the Drug Abuse Screening Test (DAST) have been tested on pregnant women. Therefore, open-ended, nonjudgmental questions about pre-pregnancy substance use at early evaluations and at follow-up to positive screens have been proposed as possibly useful tools. In particular, screening for cocaine use should target “any use” rather than Diagnostic Statistical Manual-5 (DSM-5) criteria because its use by pregnant women is typically occasional and recreational. Biological screening for cocaine use generally involves urine toxicology

that detects the metabolite benzoylecgonine up to 72 hours following use. Some researchers have noted the metabolites in urine up to two weeks following use, depending on the sensitivity of the screening. Serum toxicology, as usually conducted routinely at prenatal visits, should include substances of use/misuse. The metabolites tend to show up as long as eight hours following cocaine use (Bhuvanewar, Chang, Epstein, & Stern, (2008).

The most commonly cited adverse effect of cocaine use during pregnancy is placental abruption. Other negative effects include preterm labor, preterm delivery, premature rupture of membranes, and maternal seizures. Cocaine use frequently results in uterine contractions as well. Many of the complications associated with cocaine use can be assessed by ultrasound at 32 weeks of gestation. Serial ultrasounds conducted on a monthly basis can be used earlier to assess fetal well-being and growth, along with placental integrity. These ultrasounds can also be used in surveillance of adverse effects of other drugs of use/misuse in pregnancy. Other maternal complications may be due to poor prenatal and medical care adherence. (The craving for the next “dose” is particularly pronounced for users of crack cocaine because its first dose is at least 10 times the amount of cocaine present in one “line.) Cocaine users may further exhibit more migraine headaches during pregnancy. Cocaine-induced vasculopathy may lead to increased risk of HIV and other infectious agents by way of vertical transmission from mother to fetus (Bhuvanewar et al., (2008).

A 2013 study by Lewis et al. investigated language outcomes for children exposed prenatally to cocaine through 12 years of age. They were compared on language subtests, including syntax and phonological processing to children who were not exposed to cocaine during pregnancy. The results showed that there were small effects on language and phonological processing scores. These results are especially informative since phonological processing skills are significantly related to the reading outcomes of letter-word identification, reading fluency, and reading comprehension, skills that are associated with later literacy skills.

Medication-assisted treatments (e.g., modafinil, propranolol, disulfiram) that have been approved for use when individuals are dependent upon other substances are not the standard of care for cocaine addiction, despite demonstrations of their ability to reduce cravings for cocaine. Treatment with those medications, however, is not firmly contraindicated in pregnancy. In fact, all are designated as category C, so the risks and benefits must be weighed for each pregnant woman independently prior to treatment. Though the medications have been tested on animals, there are signs of teratogenicity, i.e., the property of being able to produce birth defects (Bhuvanewar et al., 2008).

Marijuana Use during Pregnancy

For an overwhelming majority of the states, the use of marijuana for recreational purposes is illegal. The passage of the Comprehensive Drug Abuse Prevention and Control Act of 1970 classified the drug as Schedule I on the Federal Controlled Substance Schedule. Schedule I drugs are not considered legitimate for medical use. Further, there is evidence that its use in excess by some persons can lead to marked impairment in occupational and/or social functioning (OTIS, 2015).

Marijuana contains about 400 different chemicals and some marijuana cigarettes may contain pesticides and/or other drugs. Moreover, some women who use marijuana may also use tobacco, alcohol, and/or other drugs at the same time. Women who use the drug during their pregnancy may also have other factors that result in pregnancy complications, such as inadequate or lack of prenatal care. Hence, these issues make it difficult to accurately study marijuana use during

pregnancy and lead to variable results across studies (OTIS, 2015). Such realities might explain why data on the gestational length for pregnant women who use marijuana are contradictory (Keegan et al., 2010).

Nevertheless, pregnant women who are using/abusing marijuana should be counseled about associated risks and encouraged to stop.

Intervention and/or referral to treatment should be offered. It is also recommended that these women have follow-up ultrasounds at 28 and 36 week to confirm adequacy of the growth of the fetus (Keegan et al., 2010).

It is best for pregnant women to avoid marijuana use (OTIS, 2015).

Without sound studies on different types of marijuana use (e.g., none, light, moderate, or heavy) for women during pregnancy, it is best for pregnant women to avoid the substance at this time (OTIS, 2015).

One of the most prevalent findings from research on prenatal exposure to marijuana is the impact on the child's executive functioning, which affects his/her flexible problem solving, working memory abilities, and attention. Links to subtle increases in externalizing problems, impulsivity, and hyperactivity have also been noted. Some studies have found impairment in the growth and development of the fetus due to marijuana use in pregnancy, with greater impairment the longer the woman uses. There is some evidence that marijuana may interfere with intellectual development and academic achievement in a manner similar to alcohol. Exposure to marijuana prenatally has further been linked to increased levels of depression during childhood, along with earlier initiation and higher levels of marijuana use at 14 years of age (NAIARC, 2012).

DiNieri et al. (2011) studied cannabis-related gene disturbances in the human fetus. Their findings suggested that maternal cannabis use altered developmental regulation of mesolimbic D(2)R in the newborns through epigenetic mechanisms that regulate histone lysine methylation. It is believed that the ensuing reduction of D(2)R will contribute to addiction vulnerability later in life.

Evidence exists showing marijuana can be passed to infants during breastfeeding. It is possible that the substance may also affect the quantity and quality of the breast milk made by the mother. The American Academy of Pediatrics has advised mothers who breastfeed to avoid marijuana use (OTIS, 2015).

Tobacco Use during Pregnancy

Cigarettes.

Cigarette smoke contains more than 4,000 toxins and chemicals including nicotine, tar, lead, carbon monoxide, arsenic, and, at minimum, 40 known cancer-causing agents. A number of these toxins and chemicals cross the placenta and lower the amount of oxygen and nutrients available for the developing fetus. This action can result in a direct harmful effect on the newborn (OTIS, 2014b).

The Centers for Disease Control and Prevention (CDC) reported roughly 17 percent of women who were pregnant and between the ages of 15 and 44 years as regular smokers. Thus, these women were subjecting themselves and their developing fetuses to risks that included complications during pregnancy, premature delivery, low birth weight, stillbirth, and sudden infant death syndrome (SIDS)

(NIDA, 2012).

Studies involving tobacco users have demonstrated a 1.2 to 3.6 relative risk for infertility in the preconception period. Moreover, there is an increased prevalence of smoking among younger pregnant women (less than 20 years of age) and older pregnant women (over the age of 35). Up to 15 percent of all women continue to smoke during their pregnancy. However, tobacco use is linked to more complications during pregnancy. Spontaneous abortion runs 20 to 80 percent higher in women who smoke during pregnancy than in nonsmokers. Fetuses that survive are more likely to be preterm and of low birth weight. On average, newborns exposed to tobacco during pregnancy weigh 200 to 500 grams lighter. Research further suggests that births for these newborns tend to be violent (Keegan, Parva, Finnegan, Gerson, & Belden, 2010; NIDA, 2014). A number of studies have reported a higher risk of ectopic pregnancy for women who smoke cigarettes. This is a very serious complication where the developing fetus grows outside of the uterus, typically in the fallopian tubes (OTIS, 2014b).

Withdrawal symptoms, such as tremors, increased muscle tone (rigid muscles) and irritability have been observed in newborns of mothers who smoked during the last weeks of pregnancy. These neonates also demonstrate a higher risk of asthma, bronchitis, and respiratory infections during their childhood. Smoking during pregnancy has further been linked to sudden infant death syndrome (SIDS) (OTIS, 2014b). It is possible that the newborns that survive infancy may later experience language delays or physical control and coordination problems (NAIARC, 2012). Associations have been found between behavior and learning problems and smoking during pregnancy (OTIS, 2014b).

Smokeless Tobacco.

A number of women look for a way to stop smoking cigarettes during pregnancy because they know of the problems for the developing fetus. However, some women choose to replace the cigarette with smokeless tobacco. They assume it is safer for the developing fetus. Unfortunately, it is the nicotine and not the mode of delivery that is problematic for newborn (Mann, 2011).

Using snuff during pregnancy can elevate a newborn's risk for brief pauses in breathing during sleep (i.e., sleep apnea) to a greater extent than smoking cigarettes. It is believed that other smokeless tobacco products, as well as nicotine replacement products, may carry the same risks.

Women who are pregnant should use a cold turkey approach to quit using tobacco products (Mann, 2011).

As a consequence, a number of health care professionals are asking women who are pregnant to implement a cold turkey approach to quit using tobacco products (Mann, 2011).

A study conducted in Sweden examined sleep apnea in newborns whose mothers used snuff during pregnancy, compared to those who did not use any tobacco products. The snuff used by the mothers contained nicotine, though such is not true of all types. The researchers found that the newborns of mothers who used snuff during pregnancy were two times as likely to have apnea, compared to newborns of mothers who did not use tobacco products. Moreover, it was observed that the risk was higher among snuff users than smokers. The study involved nearly 7,600 women who reported using snuff during pregnancy and close to 500 women who reported using both snuff

and smoking cigarettes (Mann, 2011).

Treatment Summary.

Pharmacological treatments have been considered a mainstay for cessation of cigarette smoking. First-line therapies, as recommended by the FDA because of their evidence of effectiveness consist of nicotine replacement therapies (NRT), bupropion, and varenicline (Douaihy, Kelly, & Sullivan, 2013). On the whole, findings from studies investigating pharmacological treatments for users of smokeless tobacco have not been as promising as desired (Ebbert & Fagerstrom, 2012). Behavioral treatments can be used in conjunction with medication or alone. They incorporate a variety of methods to assist users of tobacco products to quit, ranging from self-help materials to individual cognitive-behavioral therapy. Typically these interventions teach persons to recognize high-risk tobacco-using situations, develop new coping strategies, manage stress, improve problem solving skills, and increase social support (NIDA, 2012).

Opioid Use during Pregnancy

In the nineteenth century, pain relievers such as morphine and heroin were deemed as helpful in everyday life. However, people were not initially aware of the adverse effects associated with these and similar substances, especially the abuse potential (Musto, 1991). Over the past several decades, however, flexibility in laws governing the prescribing of opioids for the treatment of chronic non-cancer pain is said to cause the dramatic increases in opioid use. Moreover, opioid analgesics are now responsible for more deaths than the number of deaths from heroin and cocaine combined or from both motor vehicle crashes and suicide (Manchikanti et al., 2012). Some recent studies have reported nearly 22 percent of pregnant women on Medicaid and 14 percent of pregnant women with private health insurance filled a prescription for opioids during pregnancy (Government Accountability Office [GAO], 2015).

The ideal time to intervene and prevent a pregnancy in which the baby is exposed to opioids is during the preconception period. Education and awareness in advance of pregnancy is critical. Besides having conversations about the risks and benefits of exposing infants to opioids in utero, prescribing clinicians should also review a state's prescription drug monitoring program to assist in assessing the pregnant woman's history of exposure to prescription opioids (astho, 2014). Nevertheless, screening is highly recommended in early pregnancy as well (ACOG, 2014; Wong et al., 2011). Many women are unaware of their pregnancy for four to six weeks (CDC, 2014).

Opioid use in pregnancy can result in major problems for mother and her newborn (ACOG, 2012; WHO, 2014). Illicit use of opiates (e.g., heroin) can cause the pregnant woman to engage in risky and/or unhealthy activities, such as theft, prostitution, and violence, to support herself and/or her addiction. These activities, in turn, expose the woman to legal consequences, including loss of child custody, incarceration, or criminal proceedings; becoming a victim of violence; and sexually transmitted infections (ACOG, 2012). The newborns of these mothers typically experience withdrawal symptoms referred to as neonatal abstinence syndrome (NAS). NAS can also occur in newborns of mothers receiving medication-assisted treatment (MAT) in the form of methadone and/or buprenorphine for their opioid addiction (Wong et al., 2011). All newborns exposed to opioids should be monitored and treated for NAS if needed (ACOG, 2012). (NAS is discussed in greater detail in its own module in this tool guide.)

Similar to the biological method of screening for cocaine use, the urine toxicology screen is used to confirm opioid use during pregnancy. Urine screening is efficient and often the most rapid tool available, especially following findings on the physical examination (e.g., track marks) or patient self report. Methadone may be detected in urine for as long as two weeks after use. Heroin remains detectable for up to 72 hours following use. The fentanyl metabolite, norfentanyl, can be detected for a longer period of time than methadone (Bhuvaneshwar et al., 2008). (Some studies have detected norfentanyl for up to 96 hours [See Silverstein, Rieders, McMullin, Schulman, & Zahl, 1993, e.g.]). However, similar to methadone, it may not be part of the “drugs of use/misuse” urine toxicology screen in all facilities. Tests involving neonatal meconium are not yet widely available despite being shown to have at least equivalent and often greater sensitivity for maternal opioid use, when compared to urine toxicology. Though not validated in screening for opioid use, the DAST is still a widely used screening tool for opioid use in pregnancy (Bhuvaneshwar et al., 2008).

A seminal study of the reproductive health of women dependent on opioids by Armstrong, Kennedy, Kline, & Tunstall (1999) revealed the high rate at which these women become pregnant compared to women in the general population. Results indicated 54 percent of women with opioid dependence reported having at least four pregnancies in their lifetime compared to 14 percent of a nationally representative sample of women (Heil et al., 2011).

Heil et al. (2011) further studied estimates of the prevalence of unintended pregnancy for its three subtypes: mistimed pregnancy, unwanted pregnancy, and ambivalent pregnancy. Pregnancy intention of current pregnancy was measured by the question “When did you intend to become pregnant?” Response options consisted of “sooner”, “now”, “later”, “never”, and “don’t know/unsure”. “Sooner” and “now” responses classified the pregnancies as intended. “Later” responses classified the pregnancies as mistimed. Responses of “never” classified pregnancies as unwanted while “don’t know/unsure” responses resulted in an ambivalent pregnancies classification. Nearly 1,000 women with opioid dependence were included in the study.

Results indicated that nearly nine of every 10 pregnancies were unintended. This finding, thus, supported the need to develop interventions to address the extremely high rate of unintended pregnancies among women dependent on opioids (Heil et al., 2011). Similar results have been found in our state.

Voluntary, reversible long-acting contraceptives are being promoted for women of childbearing potential, including those with opioid dependence (Dreyzehner, 2015; Warren & Luskin, 2012).

The Pregnancy Risk Assessment Measurement System (PRAMS) data from 2009 showed that 86 percent of pregnant women that use opioids have unintended pregnancies compared to 50 percent of the general population of pregnant women (Dreyzehner, 2015).

Tennessee Department of Health (TDH) officials have recommended that use of voluntary, reversible long-acting contraceptives (VRLACs) be promoted for women of childbearing potential, including those with opioid dependence. (See Dreyzehner (2015) and Warren & Luskin (2012). Included among the VRLACs are intrauterine devices and subdermal implants. These strategies are much aligned with the recommendation of Heil et al. (2011) to promote interventions to address the extremely high rate of unintended pregnancies among women dependent on opioids.

Skin-to-skin contact between mother and newborn should be actively encouraged unless the new mom is unable to respond to the newborn's needs. Such contact is important regardless of the feeding choice (WHO, 2014).

Prescription Opioids and Pregnancy.

Data for 1999 to 2009 show there has been a 33 percent increase in nonmedical use of prescription opioid medications among pregnant women. This means that more women are using narcotic pain

There has been a 33 percent increase in nonmedical use of prescription opioid medications among pregnant women (astho, 2014, e.g.).

relievers in one or more of the following ways during pregnancy: without a prescription, for the experience or feeling the drug provides, or in a way other than as medication was prescribed (astho, 2014; Desai, Hernandez-Diaz, Bateman, & Huybrechts, 2014).

The most commonly used prescription medications during pregnancy are codeine (as found with Tylenol), fentanyl (Duragesic), hydrocodone (as Locet, Lortab, or Vicodin), hydromorphone (Dilaudid), morphine (Kadian or Avinza, MSIT, or MSContin), oxycodone (OxyContin or Percodan, Percocet), oxymorphone (Opana), and propoxyphene (Darvon or Darvocet) (The Partnership at Drugfree.org, n.d.)

As of March 1, 2014, Tennessee was one of 18 states to consider substance use/misuse during pregnancy to be child abuse under civil child-welfare statutes. In addition, the state is one of 10 that gives priority access in general programs to pregnant women (Guttmacher Institute, 2016; Thigpen & Melton, 2014).

It should also be noted that 50-75 percent of pregnant women dependent on opioids also have a major psychiatric disorder or mood disorder (astho, 2014; Thigpen & Melton, 2014). Among the pregnant women dependent on opioids, those with:

- Anxiety disorders are more likely to adhere to treatment.
- Mood disorders are more likely to test positive for substances while in treatment (astho, 2014).

It has also been reported that these women are heavy smokers and tend to be polydrug users (astho, 2014). Their pregnancies are often fraught with a host of medical problems including an elevated risk for obstetric complications such as stroke, premature birth, and drug withdrawal (NAIARC, 2012).

Older (2010) reported on the success of the MOTHER (i.e., Maternal Opioid Treatment: Human Experimental Research) study. Pregnant women dependent on opioids were followed a minimum of 28 days out from giving birth. The moms were addicted to opioids and rarely used other illegal drugs. Sixteen percent of moms were screened in and consented to participate in the study. These moms were further randomly assigned to either a buprenorphine or methadone treatment group.

The study supported the usefulness and safety of methadone treatments for moms dependent on opioids (Jones et al., 2010). Comparable findings were observed in a more comprehensive review of buprenorphine versus methadone treatment for pregnant mothers. In addition to the MOTHER study, the PROMISE (Pregnancy and Reduction of Opiates: Medication Intervention Safety and Efficacy) study and a second small-scale study by Fischer et al. have been examined. PROMISE was the small-scale, randomized, single site clinical trial that provided pilot data for the MOTHER study (Jones et al., 2012).

In a randomized European study, mothers who received long-acting morphine used less additional street opiates than mothers who received methadone though newborns in both groups were healthy (Kelly, Minty, Madden, Dooley, & Antone, 2011).

Baldacchino, Arbuckle, Petrie, & McCowan (2014) conducted a comprehensive meta-analysis of the consequences of opioid use by moms during pregnancy on the neurodevelopment of infants and children. They observed no significant impairments in cognitive, behavioral, or psychomotor outcomes. Nevertheless, there was a trend toward poorer outcomes for the infants and children that were exposed to opioids during pregnancy than for their non-exposed counterparts.

Treatment.

The ideal time to intervene and prevent a pregnancy in which the baby is exposed to opioids is during the preconception period. Education and awareness in advance of pregnancy is critical. Besides having conversations about the risks and benefits of exposing infants to opioids in utero, prescribing clinicians should also review a state's prescription drug monitoring program to assist in assessing the pregnant woman's history of exposure to prescription opioids (astho, 2014).

Methadone maintenance treatment (MMT) has been the most widely available treatment for opioid addiction. For pregnant women, MMT is associated with improved adherence to prenatal care, decreased exposure to illicit drugs and other high-risk behaviors, improved neonatal outcomes, and better relapse prevention. The goal is to prevent withdrawal during pregnancy and to the newborn at birth. Despite its effectiveness for pregnant women, methadone works best when applied as part of a comprehensive treatment program involving obstetric care, counseling, and wraparound services (astho, 2014). It should also be mentioned that breast feeding is safe for women in MMT and their infants unless the women are HIV-1 positive, which means they have the human immunodeficiency virus type 1. (**Women who are HIV-1 positive should never breastfeed.**) Prior to initiating MMT, efforts must be taken to determine that the pregnant female is indeed opioid dependent. Methadone must be used with extreme care in pregnant women that have compromised respiratory function (Kreek, Borg, Ducat, & Ray, 2010).

Research suggests that a large proportion of female admissions to MMT programs tend to be childbearing potential. Women in New York City's MMT program in 2007, for example, ranged in age from 18-34 years and constituted 62 percent of all the female admissions. Thus, MMT programs have the opportunity to address contraception and pregnancy planning with these women during intake and throughout their treatment (Kreek, Borg, Ducat, & Ray, 2010). It is not surprising to find that a third of the women who are sexually active report that they do not use contraception (Harding & Ritchie, 2003; Kreek, Borg, Ducat, & Ray, 2010). A CY 2013 report from TennCare indicates that only 15 percent of the women of childbearing potential prescribed narcotics were also prescribed contraceptives. Yet public health experts in the state highly recommend offering voluntary, reversible long-acting contraceptives to this category of women, particularly when they use or have a

dependence on opioids (Dreyzehner, 2015; Warren & Luskin, 2012). As many as 86 percent of women using opioids report unintended pregnancies compared to 50 percent for the general population of women (Dreyzehner, 2015).

In the event of a methadone overdose, an opioid antagonist such as naloxone is recommended. Naloxone only has a 30-minute-half-life, so more than a single dose will be needed (Kreek, Borg, Ducat, & Ray, 2010).

Increasing research on buprenorphine has resulted in greater use of this medication- assisted treatment (MAT) for the pregnant woman and fetus. There is evidence of lower risk of overdose with buprenorphine because of the ceiling effect on respiratory suppression. Subutex, the single-agent buprenorphine formulation without naloxone, continues to be promoted as the preferred medication-assisted treatment for pregnant women with opioid dependence, e.g., see the 2016 SAMHSA Advisory on buprenorphine for OUD. However, Subutex has a higher abuse or diversion risk potential.

Newer research is showing the success of buprenorphine/naloxone with pregnant women. For example, a 2013 study observed unremarkable maternal findings, comparable to what might be found after treatment with the mono-buprenorphine product. Neither were there any significant adverse neonatal outcomes during pregnancy (Deblak, Morrone, O'Grady, & Jones, 2013). Another study of pregnant women on opioids who were treated with the combination buprenorphine product versus methadone demonstrated unremarkable maternal and neonatal outcomes as well. Additionally, neonates exposed to maternal buprenorphine/naloxone had less frequent NAS and shorter overall hospitalization lengths (Wiegand et al., 2015). Despite positive maternal and neonate outcomes, buprenorphine/naloxone has not achieved preferred first-line pharmacotherapy status for pregnant women (e.g., see Berghella, Seligman, & Cleary, 2016).

There are also concerns about the benefits of buprenorphine for pregnant women that have high opiate needs. Nevertheless, it offers a different model of delivery from the highly regulated opioid treatment programs (OTPs). Buprenorphine can be prescribed in an office setting by physicians who have obtained a special SAMHSA waiver for prescribing. Further emerging research has suggested that buprenorphine exposure results in less severe NAS manifestation compared to methadone, which translates into less total morphine for treating withdrawal symptoms, shorter duration of treatment, and shorter hospital stay for the affected newborns. Data on infant and child outcomes in the long term following in utero exposure to buprenorphine are not yet available (astho, 2014). (Further discussion of the impact of opioid addiction on a prenatally exposed fetus can be found in the module on *Neonatal Abstinence Syndrome* found within this document.)

Mothers of the newborns and other family members likely need teaching and support. Mothers, in particular, may need support to deal with feelings of anxiety and/or guilt upon witnessing their newborn's withdrawal symptoms. In some cases, mothers of newborns likely need assistance dealing with distress or abusive or violent confrontations that can occur if partners or relatives communicate blame about her drug dependency. Mothers may also need positive role modeling from healthcare providers on how to recognize and respond appropriately to the newborn's cues, thereby helping to set the tone for mother-infant attachment and healthy interactions (astho, 2014).

Acupuncture for Opioid Use during Pregnancy.

This traditional method of health care with a long history of practice in China and other parts of Asia has been promoted as a supportive component of substance use treatment as well as a technique that can enable job readiness. Several thousand alcohol and drug treatment programs in the United States have added ear acupuncture to their protocol. Based on a 35-year experience at the Lincoln Hospital in Bronx, NY which delivered acupuncture treatments daily as part of its comprehensive substance disorder program, the technique serves to enhance an individual's overall functioning (Smith, 2012).

- As a nonverbal intervention, it aids in reaching resistant users/misusers of substances.
- It reduces agitation and anxiety while facilitating receptive behavior and calm.
- It helps in the development of an inner meditative core in even the most fearful and troubled individuals (Smith, 2012).

Ear acupuncture treatments are generally provided in large groups where group members sit together quietly for about 45 minutes. This process is known as the National Acupuncture Detoxification Association (NADA) protocol. Clinical personnel must be trained to use the protocol and state laws must include this training standard. The ear acupuncture protocol has been tested as a safe and inexpensive substance use treatment and/or adjunct to treatment (Smith, 2012). Dr. Wen developed the procedure, acupuncture combined with electrical stimulation at four body points and two ear points, reported relief of symptoms from opioid withdrawal in individuals with opiate addiction (Lin, Chan, & Chen, 2012).

Methamphetamine Use during Pregnancy

Methamphetamine is sometimes prescribed by a physician, but most often it is used illegally. Also known as “meth”, “speed”, “crank”, and “ice”, methamphetamine can be snorted, smoked, swallowed, inhaled, or injected (Petit, Karila, Chalmin & Lejoyeux, 2012). It works by exciting the brain with chemicals that can make people “feel good”. Methamphetamine acts as a stimulant and causes a fast heart rate, sweating, loss of appetite, hallucinations, paranoia, anxiety, trouble sleeping, and dizziness. Overdoses can lead to death or brain damage and long-term use can result in an array of health problems (OTIS, 2016).

The drug was discovered in Japan in 1919 (Narconon, n.d.). It could be injected but smoking methamphetamine created the same effects as injecting. While anyone who can read a recipe can manufacture it, today's increased abuse is the result of a new wave of extremely potent, high-purity, low-cost meth manufactured by advanced laboratories run by Mexican drug cartels. California is a favorite delivery location for the popular drug (Methamphetamines.com, 2013; Stewart, 2015).

Female users of methamphetamine tend to have high levels of psychiatric symptoms and psychological problems, in general. In addition, many of the women begin using methamphetamine to lose weight. It has been hypothesized that gender roles that stress the thin-ideal body image exacerbate use, especially among White, Pacific Islander, and Native American women (Wright, Schuetter, Fombonne, Stephenson, & Haning III, 2012).

It is extremely difficult to sort out the specific effects of methamphetamine because roughly 80 percent of the women who use the substance also use nicotine and/or alcohol. One study has tried to separate the effects and found that both methamphetamine and alcohol impair the part of the brain responsible for verbal memory and learning and attention. However, it was further observed that methamphetamine had a

negative impact even beyond that of alcohol alone (NAIARC, 2012).

Good, Solt, Acuna, Rotmensch, & Kim (2010) conducted a single site chart review from 2000 to 2006 where pregnant methamphetamine users were compared to the general obstetric population during the same period for various demographic factors and perinatal outcomes.

Methamphetamine use during pregnancy is complicated by more morbid neonatal and maternal outcomes when compared with the general obstetric population (Good, Solt, Acuna, Rotmensch, & Kim, 2010).

Factors significantly associated with methamphetamine use were preterm delivery, low Apgar scores, cesarean delivery, and neonatal mortality. Maternal demographic characteristics also indicated that these women were more likely to use other abusive substances, be unemployed, and have higher rates of domestic violence and adoption. It should also be noted that exposure to methamphetamine prenatally influences development of the verbal memory system above the effects of prenatal exposure to alcohol. Furthermore, these methamphetamine-exposed babies taxed hospital staff and ultimately burdened the foster care system. In short methamphetamine use during pregnancy is complicated by more morbid neonatal and maternal outcomes when compared with the general obstetric population.

A segment of the Infant Development Environment and Lifestyle (IDEAL) Study characterized methamphetamine usage patterns during pregnancy. Study sites in the United States included Tulsa, OK; Los Angeles, CA; Honolulu, HI; and Des Moines, IA. The researchers found variation in methamphetamine use during pregnancy. Some women consistently used the drug at a high rate throughout their pregnancy; some increased their use during pregnancy; some decreased their use; and some maintained a steady though not high level of use. Of the women showing decreased use during pregnancy, however, they were most likely to replace their diminished methamphetamine intake with alcohol. Thus, this group became polysubstance users during pregnancy, thereby increasing risks for themselves and their newborn (Grotta et al., 2010).

Methamphetamine use by women who are pregnant is not as well studied as use of alcohol, cocaine, and opiates. Moreover, women who use/misuse meth commonly use other drugs such as alcohol and tobacco, thus likely confounding birth outcomes. However, the increased risk of low birth weight and small for gestational age reported for newborns exposed to other substances of use/misuse during pregnancy also manifests in births associated with methamphetamine use (ACOG Committee on Health Care for Underserved Women, 2011; Wright et al, 2012). There is further evidence of increased rates of premature delivery and placental abruption (i.e., the separation of the placental lining from the uterus) (NIDA, 2013). Women that were actively using meth during their pregnancy should not breastfeed due to the inability to predict harmful effects associated with the ingredients used to cook it (ACOG Committee on Health Care for Underserved Women, 2011).

Neonates exposed to methamphetamine during pregnancy typically are being born too early and too small. They are also at risk for life-long breathing, vision, hearing, and learning problems. Some research suggests that methamphetamine can increase the chance for sudden infant death syndrome

(SIDS), even in neonates not born early (OTIS, 2016).

Evidence about whether methamphetamine increases the chance of birth defects is mixed. It is further not known whether prenatal exposure to methamphetamine can cause intellectual or behavioral problems in older children. A few studies have shown that if a mother uses methamphetamine later in her pregnancy, the newborn can show signs of withdrawal at birth. Symptoms include having very floppy or tight muscles, difficulty eating, sleeping too little or too much, and being very jittery. Withdrawal symptoms usually go away within a few weeks, but it is possible that the newborn will be admitted to the special care unit and have longer hospital stays. Some neonates have tremors and too much or too little muscle tone for many months after birth. These symptoms go away on their own in many cases, but these children might benefit from programs such as infant stimulation or physical therapy (OTIS, 2016).

At the time of this writing, there are no pharmacologic treatments that have shown to be effective in curbing methamphetamine use, prolonging abstinence, or counteracting the drug's special effects (ACOG Committee on Health Care for Underserved Women, 2011; NIDA, 2013). Three double-blind placebo-controlled trials using bupropion, naltrexone, and modafinil have shown positive results in reducing methamphetamine or amphetamine use. Two studies employing agonist replacement medications, one with methylphenidate and the other with d-amphetamine, have also shown promise. Continued efforts are being made to develop medications for the treatment of methamphetamine dependence (Karila, 2010).

Treatment for Methamphetamine Addiction.

Pharmacotherapy does not yet exist for treatment for methamphetamine use (ACOG Committee on Health Care for Underserved Women, 2011; Karila et al., 2010; NIDA, 2013; Petit et al., 2012). All treatments at this time are psychosocial and primarily behavioral.

1. First, every woman that reports using methamphetamine should receive counseling and be offered assistance in discontinuing use. Thus clinicians must ask the question(s) about alcohol and substance use.
2. Treatment outcomes are more positive when enrollment into residential care is voluntary.
3. Outpatient treatment, if used, must be very intensive during the first several weeks. This means three to five sessions per week early in the treatment phase and dropping to two to three sessions each week for the next 90 days.
4. Recommended treatment components include cognitive-behavioral therapy (CBT) that incorporates the Matrix model, family education, behavioral therapy, individual counseling, 12-step support, and random substance use testing. (The Matrix model typically runs for 16 weeks.)
5. Contingency management interventions that offer incentives for treatment engagement and abstinence have also shown effectiveness (ACOG Committee on Health Care for Underserved Women, 2011; NIDA, 2013; Petit et al., 2012).
6. Comprehensive prenatal care should be part of the treatment package. This means the women

should receive a nutritional assessment and linked to social support services.

7. Pregnant women using methamphetamine should further be tested for HIV and sexually transmitted infections (ACOG Committee on Health Care for Underserved Women, 2013).

Amphetamine Use during Pregnancy

Amphetamine use during pregnancy is increasing worldwide. Pregnant women that use amphetamines illegally tend to have lower household incomes, be socially deprived, younger, have less formal education, lack private insurance, have little support through a partner or family, less likely to obtain appropriate prenatal care, and be involved in a marginalized lifestyle, e.g., domestic violence situation. Very few studies abound for pregnant mothers legally prescribed amphetamines for conditions such as attention deficit hyperactivity disorder (ADHD) (Oei et al., 2012).

Prenatally, it is important to help the amphetamine user who is pregnant to secure adequate shelter and nutrition, treat any co-occurring psychiatric morbidities, and keep her prenatal care appointments. Research suggests these pregnant moms seek prenatal care less frequently than other known pregnant users of substances (Oei et al., 2012). Since there appears to be no detrimental effect associated with discontinuation of use during pregnancy, every reasonable effort should be undertaken to encourage known users/misusers who are pregnant to stop (Keegan et al., 2010).

Sedatives-Hypnotics and Anxiolytics Use during Pregnancy

Butalbital, the active ingredient in Fiorinal and Fiorocet, is a barbituate that is frequently used in the treatment of migraines which are more common in women. Both medications were Category C on the FDA's Fetal Risk Summary, meaning there were not any controlled studies of their harmful effects on fetuses. However, these medications should only be prescribed to pregnant women if the benefits outweigh the risks (Keegan, Parva, Finnegan, Gerson, & Belden, 2010).

Benzodiazepines, however, were Category D medications, indicative of positive evidence of human fetal risk based on adverse reaction data from marketing or investigational studies or experience in humans (Sanz & De las Cuevas, 2006). Again, the risk must be weighed against the medical condition for which the pregnant woman is being treated. Physicians should be on high alert if women are abusing benzodiazepines during pregnancy. There tends to be use/misuse of other substances in these cases (Keegan et al., 2010).

Alprazolam, a benzodiazepine commonly used in the treatment of anxiety, is contraindicated in pregnant women. The drug maker further warns that alprazolam could cause harm to the unborn baby and/or addiction or withdrawal symptoms at birth (Alprazolam, 2012; Sanz & De las Cuevas, 2006).

A rehabilitation program should be considered for women who are heavy users of sedative-hypnotics during pregnancy. An evaluation by a psychiatrist or migraine specialist might also be helpful as he or she may be able to help the woman transition away from the addictive medications. Newborns exposed to benzodiazepines or barbituates during pregnancy are further likely to experience significant withdrawal symptoms (Keegan et al., 2010).

Antiepileptic Drug (AEDs) Use during Pregnancy

No antiepileptic drug has proven safe in pregnancy in terms of teratogenesis at this time. Therefore, treatment for pregnant women must be individualized (Wilner, 2010).

Women with epilepsy who are considering pregnancy or currently pregnant should be carefully reassessed. Antiepileptic medication may no longer be necessary for women with persistent nonepileptic events, such as syncope or migraine that were misdiagnosed as epilepsy. A similar non-need might also be considered for women with ill-defined “spells” that have since gone away. Moreover, there are women that may have epilepsy that is sufficiently controlled (i.e., seizures have not been evident for several years) so that a trial off medication before conception could be warranted (Wilner, 2010).

Use of antiepileptic drugs (AEDs) by pregnant women has been linked to immediate withdrawal effects of the newborn, as well as to long-term neurologic dysfunctions (Sanz & Delas Cuevas, 2006). More current evidence suggests that women taking antiepileptic medication, in particular valproate, during the first trimester are at highest risk for congenital malformations. Phenobarbital and phenytoin also result in adverse cognitive outcomes for the children. Newer antiepileptic medications such as levetiracetam may not be safer. Much more research on these newer medications in terms of teratogenesis is needed (Wilner, 2010).

In short, use of antiepileptic medications with pregnant women should adhere to the following recommendations:

1. Start by assessing whether the patient really needs antiepileptic treatment.
2. Choose the drug that is well tolerated and controls the seizures (but avoid valproate).
3. Use as few drugs as possible at the lowest effective dose.
4. Regularly monitor drug levels during pregnancy (Wilner, 2010).

Selective Serotonin Reuptake Inhibitor (SSRI) Use during Pregnancy

Selective serotonin reuptake inhibitors (SSRIs) are frequently used during pregnancy, largely for the treatment of depressive disorders in the mothers. In fact, their use during pregnancy has increased because of the favorable risk to benefit ratio. However, short-term adverse outcomes in the form of a withdrawal syndrome similar to neonatal abstinence syndrome (NAS) have occurred in up to 30 percent of newborns exposed in utero to these medications. Among the short-term effects include signs of both central nervous system depression and excitation, decreased changes in behavioral states, autonomic symptoms, and abnormal sleep organization. These symptoms primarily affect the neonate’s respiratory and gastrointestinal systems. In addition there is some evidence of small head circumference at birth, but cognitive ability does not appear to be impacted (Klinger et al., 2011).

In 2011, the FDA updated its safety announcement on the use of SSRI antidepressants by pregnant women and the potential risk of a rare heart and lung condition known as persistent pulmonary hypertension of the newborn (PPHN). PPHN occurs when a newborn does not adapt to breathing outside the womb and may require intensive care support including a mechanical ventilator to increase their oxygen level. In severe cases, PPHN can result in damage to multiple organs, including the brain, and even death.

The initial advisory was published in July 2006 and based on a single published study. Newer studies evaluating this potential risk have shown conflicting findings, thereby making it unclear whether use of SSRIs during pregnancy can cause PPHN. Hence, the FDA has recommended that health care providers treat depression during pregnancy as clinically appropriate (FDA, 2012).

Psychiatric Medication Use during Pregnancy

Mental illness can bring increased risks and difficulties during and after pregnancy, such as birth complications and a worsening of symptoms (Collingwood, 2010; Sanz & De las Cuevas, 2006). Serious mental illness such as schizophrenia is not as common but about 20 percent of women will experience clinically diagnosable anxiety or depression during pregnancy and the postpartum period (Collingwood, 2010).

Despite the lack of pregnancy safety data for many medications, some researchers have observed as many as 16 percent of women being treated for depression, for example, taking medications with potential for fetal harm. During pregnancy, the treatment plan should be based on the woman's current mental state and medication, as well as previous treatment, history of past mental illness, and family history of mental illness during pregnancy. Considerations should also be given to the woman's pregnancy-related fears, substance use, and support network (Collingwood, 2010). Discontinuing effective psychotropic treatments can worsen the mental health of the mother, causing secondary effects to the unborn child (Sanz & De las Cuevas, 2006). In addition, sudden stoppage of treatment can result in side effects and relapse (Collingwood, 2010).

Pregnancy outcomes for antipsychotic medications vary widely depending on the type of medication. Exposure to low-strength antipsychotics during the first trimester is associated with a small additional risk of congenital anomalies overall (Collingwood, 2010).

Management and treatment are complex and require careful consideration by the psychiatrist of any impact on mother and her fetus, in addition to the possibility of increased risk of obstetric complications and congenital malformations (Sanz & De las Cuevas, 2006). The National Institute of Mental Health (NIMH) affirms that medication decisions should be based on each woman's circumstances and needs. Further, medication selection should be based on available scientific research and prescriptions should be written for the lowest dose possible. Moreover, pregnant women on psychotropic medications should be watched closely throughout their pregnancy as well as after delivery (NIMH, 2012).

Substance Use, Pregnancy, and Birth Outcomes: General Summary

Many substances, if used during pregnancy produce teratogenic effects (e.g., facial and skeletal abnormalities). Such use further adversely affects developing neurological systems, brain organization and fetal growth and/or maturation.

Table 1 below summarizes the potential effects of prenatal exposure to the more commonly used substances on birth outcomes, central nervous system development cognitive function, and behavior. The table should be interpreted in conjunction with the fact that outcomes of newborns exposed to substances *in utero* depend, in part, upon the quality of care received by the mother during pregnancy (Jensen, 2014).

Table 1. Potential effects of prenatal substance exposure on birth outcomes, central nervous system development, cognitive function, and behavior

Substance	Birth Effects	Effects on CNS development, cognitive function, and behavior
Nicotine	<ul style="list-style-type: none"> ➤ Prematurity ➤ Decreased birth weight, height, head circumference ➤ Sudden infant death syndrome ➤ Increased infant mortality rate 	<ul style="list-style-type: none"> ➤ Excitability, hypertonia ➤ Conduct disorder, reduced IQ, aggression, impulsivity, ADHD, antisocial behavior
Marijuana	<ul style="list-style-type: none"> ➤ No fetal growth effects ➤ No physical abnormalities 	<ul style="list-style-type: none"> ➤ Prematurity ➤ Decreased birth weight, height, head circumference ➤ Intraventricular hemorrhage
Methamphetamine	<ul style="list-style-type: none"> ➤ Decreased birth weight ➤ Small for gestational age 	<ul style="list-style-type: none"> ➤ Poor movement quality, increased lethargy, lower arousal, increased physiological stress ➤ No motor or mental delay
Cocaine	<ul style="list-style-type: none"> ➤ No fetal growth effects ➤ No physical abnormalities 	<ul style="list-style-type: none"> ➤ Mild withdrawal symptoms; poor autonomic control, particularly of state regulation (the ability to adjust one's level of alertness as required for a task) ➤ Executive function impairment, reading and spelling difficulty
Heroin/Opioids	<ul style="list-style-type: none"> ➤ Prematurity ➤ Decreased birth weight, height, head circumference ➤ Sudden infant death syndrome 	<ul style="list-style-type: none"> ➤ NAS, strabismus, less rhythmic swallowing ➤ Possible delay in general cognitive function, aggression, anxiety, inattentive/disruptive behavior

Source: Jensen, 2014

It should be noted that pregnancy can serve as a motivating factor for entry into a treatment

program. Such a program might focus on improving prenatal care, optimizing maternal physical and mental health, and reducing withdrawal symptoms and cravings for substances, as well as behavioral problems (Jensen, 2014).

Treatment

While it is important to limit exposure to medications during pregnancy because of the potential harm to the developing fetus, untreated chronic illnesses, such as substance dependence, particularly to opioids, are linked to increased mortality and morbidity (Goodwin et al., 2007). Collaborative partnerships are essential to successfully serving pregnant women (BSAS, 2011). Yet, national data suggested almost 85 percent of women who needed substance use treatment during pregnancy and/or following childbirth either did not perceive the need for treatment or failed to receive treatment (Gibbons et al., 2010).

Withdrawal management (i.e., detoxification) during pregnancy is not recommended (Bhuvanewar et al., 2008; SAMHSA/CSAT/DPT, 2015). At least that's the position of the American Congress of Obstetricians and Gynecologists (ACOG) (IRETA, 2014). However, there are other recommendations. One approach allows the pregnant woman to withdraw from MAT and stay in the treatment program, but requires a mid-level practitioner, preferably a physician experienced in addiction medicine, to supervise the withdrawal process with regular fetal assessments, as appropriate, for the gestational age. Some experts specify that withdrawal, if implemented, should not be initiated before 14 weeks or after 32 weeks gestation (Bhuvanewar et al., 2008; SAMHSA/CSAT/DPT, 2015). Other experts recommend waiting until the end of the first trimester, which is very close in time frame to the former recommendation.

Limited data has shown miscarriage rates may be higher in the first trimester so waiting to employ detoxification may improve the fetus' survival chances. Some case reports of detoxification (i.e., withdrawal management) during pregnancy have reflected miscarriages, preterm births, meconium passage, stillbirth, and elevated norepinephrine and epinephrine levels, in addition to unsuccessful relapse rates of 50 percent or higher (Prasad, 2014). A more recent Tennessee study involving more

A Tennessee study involving more than 300 pregnant women dependent on opioids did not show detoxification to be harmful (Bell, Towers, Hennessy, Heitzman, Smith, & Chattin, 2016).

than 300 women detoxifying from opiates during pregnancy has shown some promising results. Nearly 75 percent of the women were younger than 30 years of age and 78 percent were multiparous, i.e., had given birth at least twice. **Overall the data did not show detoxification to be harmful to the fetus.** Compared to other

groups in the study, women who were fully detoxified and remained in long-term behavioral health settings had better relapse rates and their newborns had low NAS rates. The researchers acknowledged the need for further research but concluded that intense behavioral health follow-up is necessary for continued success once a woman has been fully detoxified (Bell, Towers, Hennessy, Heitzman, Smith, & Chattin, 2016).

The literature suggests that it is best to adopt a team approach with regard to withdrawal and/or replacement of substances used and/or misused by women during pregnancy. Incorporate a

system-based practice model involving neonatologists, psychiatrists, psychologists, and social workers (Keegan et al., 2010). Nonetheless, the best strategy for ameliorating many of the complications of substance use during pregnancy is prenatal care (Wright et al., 2012).

Maintenance therapy is recommended for pregnant opioid users, unless the maintenance drug is not well tolerated (Outcome is a function of person's social deprivation and the extent to which other substances, legal and/or illegal, are used concomitantly [Soyka, 2013].) Methadone maintenance treatment (MMT) is the most widely available treatment for opioid addiction. For pregnant women, MMT is associated with improved adherence to prenatal care, decreased exposure to illicit drugs and other high-risk behaviors, improved neonatal outcomes, and better relapse prevention. The goal is to prevent withdrawal during pregnancy and to the newborn at birth (astho, 2014). Hence, MMT goals for pregnant women include improved fetal as well as maternal outcomes (Fullerton et al., 2014). Despite its effectiveness for pregnant women, methadone works best when applied as part of a comprehensive treatment program involving obstetric care, counseling, and wraparound services (astho, 2014). It should also be mentioned that breast feeding is safe for women in MMT and their infants unless the women are HIV-1 positive, which means they have the human immunodeficiency virus type 1. (*Women who are HIV-1 positive should never breastfeed* [Kelly et al., 2011; Kreek, Borg, Ducat, & Ray, 2010].) Prior to initiating MMT, efforts must be taken to determine that the pregnant female is indeed opioid dependent. Methadone must be used with extreme care in pregnant women that have compromised respiratory function (Kreek et al., 2010).

Research suggests that a large proportion of female admissions to MMT programs tend to be childbearing potential. Women in New York City's MMT program in 2007, for example, ranged in age from 18-34 years and constituted 62 percent of all the female admissions. Thus, MMT programs have the opportunity to address contraception and pregnancy planning with these women during intake and throughout their treatment (Kreek et al., 2010). It is not surprising to find that a third of the women who are sexually active report that they do not use contraception (Harding & Ritchie, 2003; Kreek et al., 2010).

Increasing research on buprenorphine has resulted in greater use of this medication- assisted treatment (MAT) for the pregnant woman and fetus. There is evidence of lower risk of overdose with buprenorphine because of the ceiling effect on respiratory suppression (astho, 2014). Subutex, the single-agent buprenorphine formulation without naloxone, is preferred for pregnant women (astho, 2014; Federation of State Medical Boards, 2013), but it does have a higher abuse or diversion risk potential. There are also concerns about the benefits of buprenorphine for pregnant women that have high opiate needs. Nevertheless, it offers a different model of delivery from the highly regulated OTPs. Buprenorphine can be prescribed in an office setting by physicians who have obtained a special SAMHSA waiver for prescribing. Further emerging research has suggested that buprenorphine exposure results in less severe NAS manifestation compared to methadone, which translates into less total morphine for treating withdrawal symptoms, shorter duration of treatment, and shorter hospital stay for the affected newborns. Data on infant and child outcomes in the long term following in utero exposure to buprenorphine are not yet available (astho, 2014). Research has suggested that women be switched to buprenorphine monotherapy if they become pregnant because there is insufficient data to support the safety of the buprenorphine/naloxone combination (Soyak, 2013).

Mothers of newborns as well as other family members likely need teaching and support. The mothers, in particular, may need support to deal with feelings of anxiety and/or guilt upon witnessing their newborn's withdrawal

Mothers of newborns as well as other family members need teaching and support (astho, 2014).

symptoms. In some cases, mothers of newborns may need help dealing with distress or abusive or violent confrontations that can occur if partners or relatives communicate blame about her drug dependency. Mothers may also need positive role modeling from health care providers on how to recognize and respond appropriately to the newborn's cues, thereby helping to set the tone for mother- infant attachment and healthy interactions (astho, 2014). Best practice shows that babies born to women addicted to opioids fared better when the mothers received medication-assisted treatment in the form of buprenorphine or methadone, compared to babies whose mothers received no treatment (NIDA, 2010). Moreover, newer studies involving buprenorphine show the same clinical outcomes as methadone, but a reduction in withdrawal symptoms (e.g., Jones et al., 2012; Lacroix, Hammou, & Montastruc, 2011). NAS severity appears to be a greater function of the use of other drugs rather than the buprenorphine dose. Recent research has shown buprenorphine emerging as first-line treatment for opioid users who are pregnant (Soyka, 2013).

Other Treatments

The best strategy for reducing substance use complications during pregnancy is prenatal care (Wright et al., 2012).

Since prenatal care is the best strategy for reducing substance use complications during pregnancy, it follows that *harm-reduction programs* should be provided for pregnant women (Wright et al., 2012). Key components of such programs consist of:

- Improvements in nutrition
- Reduction in smoking
- Reduction in substance use including alcohol (Wright et al., 2012)
- Encouragement of breastfeeding, when appropriate (Thigpen & Melton, 2014; Wright et al., 2012)
- Promotion of dental health
- Encouragement of physical activity
- Encouragement of early and continuing prenatal care
- Promotion of social and community support (Wright et al., 2012)

A study of pregnant women in Hawaii who used methamphetamine during pregnancy demonstrated successful maternal and birth outcomes in such a program. There were increased prenatal visits that tended to be associated with better participation in other clinic services, which translated into increased abstinence. The abstinence rates were high despite not mandating an abstinence-only approach. Quality prenatal care involving four visits at minimum were shown to significantly improve birth outcomes. The findings suggest that providing a comprehensive approach to the treatment of women with addiction issues is paramount. All components of a woman's life must be addressed. This harm-reduction program further resulted in relatively low rates of postpartum depression (Wright et al., 2012).

Managing Relapse

Young and old alike run the risk of returning to substance use and/or at high rates following treatment. Estimates show between 67 percent and 80 percent thirds and four-fifths start using again in the six months after community-or hospital-based treatment (Ramo & Brown, 2008).

Ideally the individual's warning signs should be recognized in advance of any substance use while conducting regular drug screens. Carefully observe and review the person's behavior. For example, has the individual stopped attending sessions regularly? If showing up for scheduled appointments, note the person's clinical presentation at EACH visit. Look for any changes that might be precursors to relapse. Probing carefully will often shed light on patterns of substance use. In the case of detected or admitted substance use, acknowledge it in a nonjudgmental way, neither condoning nor punishing the behavior. Though any substance use is of concern, which substance a person is turning to since treatment is crucial in determining areas for revision in the treatment plan (Ramo & Brown, 2008).

Compared to women in the third trimester of pregnancy, mothers of children under three months of age in the household had much higher rates of past month cigarette use, marijuana use, alcohol use, and binge alcohol use. This finding suggests resumption of substance use among mothers in the three months following childbirth. Thus, there is a need to address use of effective interventions for women to prevent postpartum resumption of substance use and improve their overall health and wellbeing, as well as that of their young infants (SAMHSA/OAS, 2009).

A recent study examined the rates of abstinence in pregnancy and relapse postpartum for nicotine cigarettes, marijuana, cocaine, and alcohol. Self-reports and urine

toxicologies were collected during pregnancy and 24-months following delivery. The researchers observed that 83 percent of women achieved abstinence to at least one substance in pregnancy, with abstaining a more likely outcome for marijuana, cocaine, and alcohol than cigarettes. However, 80 percent of the women who were abstinent in the last month of their pregnancy have relapsed to at least one substance postpartum. Women using cocaine, however, were less likely to relapse after

There is a need to address the use of effective interventions for women to prevent postpartum resumption of substance use and improve their overall health and wellbeing, as well as that of their young infants (SAMHSA/OAS, 2009).

attaining abstinence compared to women who used marijuana, alcohol, or cigarettes (Forray, Merry, Haiqun, Ruger, & Yonkers, 2015).

More Contraindications

It is recommended that Naltrexone and Antabuse® be avoided during pregnancy.

Naltrexone has the ability to precipitate severe opioid withdrawal in patients taking buprenorphine or methadone, which could be fatal to the fetus. Antabuse® has teratogenic effects which means the developing fetus could develop an intellectual disability and/or some sort of growth deficiency, e.g. (Ramo & Brown, 2008).

Resources

Books/Curriculum.

Every Step of the Way (ESW).

- ✓ *Every Step of the Way (ESW)* is a thin, power-packed book designed for pregnant women. In particular, it has special value for women at risk of using substances during their pregnancy. Rather than focus on the hazards of substance use, it addresses the benefits of a healthy pregnancy. The substance focus of this book is alcohol, primarily because it is the most commonly used substance, even when other substances such as cocaine, heroin, or prescription pain relievers, might be the preferred substance of choice. The message to the women is to avoid any and all substance use during pregnancy.
- ✓ *Every Step of the Way: Parents' Guide* provides a month-by-month approach to what a healthy, developing baby looks like, as well as the risks alcohol (and/or other substances) may pose to the baby. The book is a blend of clinical research and imaginative writing exercises to connect the mother to her baby and foster healthy decision making throughout pregnancy. This guide is sold in a pack of 10.

I Am Concerned... (IAC).

- ✓ *I Am Concerned...* is a pre-treatment curriculum designed for use in the primary prenatal care setting for pregnant women who need some form of drug treatment, but refuse to get it. It is a brief intervention that focuses on the risks linked to continued substance use. The book contains background information on drug use among women, the brief intervention approach and drug-specific information on alcohol, cocaine, heroin, marijuana, methamphetamines, Oxycontin, PCP, and tobacco.

Video.

National Organization on Fetal Alcohol Syndrome (NOFAS) Web site.

Medical Experts on Light Drinking during Pregnancy – Short video clip in which various medical experts promote no drinking during pregnancy. However, they try reduce hysteria among women who have continued to drink during their pregnancy by getting them to embrace the benefits of abstinence, whenever that occurs during pregnancy. The YouTube link to this video is <http://www.nofas.org/light-drinking/>.

Web Source.

MotherToBaby Fact Sheets.

MotherToBaby is a service of the Organization of Teratology Information Specialists (OTIS), a nonprofit organization dedicated to providing evidence-based information to mothers, health care professionals, and the general public, with a focus on expectant mothers and their fetuses. The organization's experts have developed fact sheets to answer questions that are frequently asked in relation to exposures during pregnancy and breastfeeding. The fact sheets provide general information and are not meant to replace the advice health care providers. Nevertheless, fact sheets are available on medications (e.g., albuterol, tylenol), herbal products such as St. John's Wort, infections and vaccines (e.g., chicken pox and vaccine, hepatitis A), maternal medical conditions such as asthma and diabetes, illicit substances (e.g., cocaine), and other common exposures such as alcohol, caffeine, and carbon monoxide. Both English and Spanish versions of the fact sheets are accessible at no cost from <http://www.mothers-to-baby.org/otis-fact-sheets-s13037#5>. There is also a toll free number on the Web site that can be used to speak to a MotherToBaby expert.

References

- about.com. (2013, May 12). Drinking while pregnant increases newborn infection risks. Retrieved February 5, 2014, from <http://alcoholism.about.com/od/preg/a/blnu050614.htm>.
- Alprazolam. (Revised 2014, October 22). Retrieved July 2, 2014, from <http://www.drugs.com/alprazolam.html>.
- American College of Obstetricians and Gynecologists (ACOG). (2008). At-risk drinking and illicit drug use: Ethical issues in obstetric and gynecologic practice. Committee opinion No., 422. *Obstetrics & Gynecology*, 1-12.
- American College of Obstetricians and Gynecologists (ACOG) Committee on Health Care for Underserved Women. (2011). Methamphetamine abuse in women of reproductive age. Committee opinion No., 479. *Obstetrics & Gynecology*, 117, 751-755.
- American College of Obstetricians and Gynecologists (ACOG). (2012). Opioid abuse, dependence, and addiction in pregnancy. Committee opinion No., 524. *Obstetrics & Gynecology*, 119, 1070-1076.
- American Pregnancy Association. (2014, May). Using illegal drugs during pregnancy. Retrieved September 7, 2014, from <http://americanpregnancy.org/pregnancyhealth/illegaldrugs.html>.

- Back, S.E., Contini, R., & Brady, K.T. (2006). Substance abuse in women: Does gender matter? *Psychiatric Times*, 1-6. Retrieved June 8, 2016, from <http://www.psychiatrictimes.com/substance-use-disorder/substance-abuse-women-does-gender-matter>.
- Bauer, A.M. & Li, Y. (2013). Neonatal abstinence syndrome and maternal substance abuse in Tennessee: 1999-2011. Nashville: Tennessee Department of Health.
- Bell, J., Towers, C.V., Hennessey, M.D., Heitzman, C., Smith, B., & Chattin, K. (2016). Detoxification from opiate drugs during pregnancy. *American Journal of Obstetrics & Gynecology*, 1-6.
- Berghella, V., Seligman, N.S., & Cleary, B.J. (2016, April 19). Buprenorphine substitution therapy in pregnancy. *UpToDate*. NY: Wolters Kluwer. Retrieved June 30, 2016, from <http://www.uptodate.com/contents/buprenorphine-substitution-therapy-in-pregnancy?topicKey=OBGYN%2F87238&elapsedTimeMs=8&view=print&displayedView=full>.
- Bhuvanewar, C.G., Chang, G., Epstein, L.A., & Stern, T.A. (2008). Cocaine and opioid use during pregnancy: Prevalence and management. *Primary Care Companion: Journal of Clinical Psychiatry*, 10(1), 59-65.
- Bureau of Substance Abuse Services (BSAS, Massachusetts Department of Public Health. (2011, December). Practice guidance: Treatment services for pregnant women. Retrieved May 31, 2014, from <http://www.mass.gov/eohhs/docs/dph/substance-abuse/care-principles/care-principles-guidance-pregnant-women.pdf>.
- Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities (CDC/NCBDDD). (2004). Fetal alcohol syndrome: Guidelines for referral and diagnosis. Atlanta, GA: Author.
- Centers for Disease Control and Prevention (CDC) Web site. (2005). Advisory on alcohol use in pregnancy. Retrieved June 10, 2014, from <http://www.cdc.gov/ncbddd/fasd/documents/surgeongenbookmark.pdf>.
- Centers for Disease Control and Prevention (CDC) Web site. (2014, April 17). Alcohol use in pregnancy. Retrieved June 10, 2014, from <http://www.cdc.gov/NCBDDD/fasd/alcohol-use.html>.
- Chang, G. (2014). Screening for alcohol and drug use during pregnancy. *Obstetrics & Gynecology Clinics of North America*, 41, 205-212.
- Chasnoff, I.J. & McGourty, R.F. (2011). *Every step of the way: Talking with pregnant women: Advantages of a substance-free pregnancy*. Chicago, IL: NTI Upstream.
- Chasnoff, I.J., McGourty, R.F., Bailey, G.W., Hutchins, E., Lightfoot, S.O., Pawson, L.L., . . . , Campbell, J. (2005). The 4P's Plus Screen for substance use in pregnancy: Clinical application and outcomes. *Journal of Perinatology*, 25(6), 368-374.
- Chen, W.A. & Maier, S.E. (2011). Combination drug use and risk for fetal harm. *Alcohol Research & Health*, 34(1), 27-28.

- Clarren, S.K. & Salmon, A. (2010). Prevention of fetal alcohol spectrum disorder: Proposal for a comprehensive approach. *Expert Reviews in Obstetrics and Gynecology*, 5(1) 23-30. doi: 10.1586/EOG.09.72
- College on Problems of Drug Dependence (CPDD). (1995). Research advances fact sheet: Medication treatments for substance use disorders. *Drug and Alcohol Dependence*, 39(3), 264-265. DOI: [http://dx.doi.org/10.1016/0376-8716\(95\)90039-X](http://dx.doi.org/10.1016/0376-8716(95)90039-X)
- Collingwood, J. (2010). Pregnancy and Psychotropic Medications. *Psych Central*. Retrieved March 6, 2015, from <http://psychcentral.com/lib/pregnancy-and-psychotropic-medications/0003388>.
- Das, G. (1993). Cocaine abuse in North America: A milestone in history. *Journal of Clinical Pharmacology*, 33(4), 296-310.
- Debelak, K., Morrone, W.R., O'Grady, K.E., & Jones, H.E. (2013). Buprenorphine + naloxone in the treatment of opioid dependence during pregnancy-initial patient care and outcome data. *American Journal on Addictions*, 22(3):252-4. doi: 10.1111/j.1521-0391.2012.12005.x
- Desai, R.J., Hernandez-Diaz, S., Bateman, B.T., & Huybrechts, K.F. (2014). Increase in prescription opioid use during pregnancy among Medicaid-enrolled women. *Obstetrics & Gynecology*, 123(5), 997-1002.

- DiNieri, J.A., Wang, X., Szutorisz, H., Spano, S.M., Kaur, J., Casaccia, P., ... Hurd, Y.L. (2011). Maternal cannabis use alters ventral striatal dopamine D2 gene regulation in the offspring. *Biological Psychiatry*, 70(8), 763-769. doi: 10.1016/j.biopsych.2011.06.027
- Douaihy, A.B., Kelly, T.M., & Sullivan, C. (2013). Medications for substance use disorders. *Social Work in Public Health*, 28(0), 264-278. doi:10.1080/19371918.2013.759031.
- Eiden, R.D., Granger, D.A. Schuetze, P., & Veira, Y. (2011). Child behavior problems among cocaine-exposed toddlers: indirect and interactive effects. *Development and Psychopathology*, 23, 539-550.
- El-Mohandes, A., Herman, A.A., El-Khorazaty, M.N., Katta, P.S., White, D., & Grylack, L. (2003). Prenatal care reduces the impact of illicit drug use on perinatal outcomes. *Journal of Perinatology*, 23, 354-360. doi: 10.1038/sj.jp7210933
- Fishman, J. (n.d.). Women, addiction, and mental health: The vulnerable population. Cincinnati, OH: Union Institute & University. Retrieved March 14, 2014, from <http://www.addictionpro.com/whitepaper/women-addiction-and-mental-health-vulnerable-population>.
- Floyd, R.L., Weber, M.K., Denny, C., & O'Connor, M.J. (2009). Prevention of fetal alcohol spectrum disorders. *Developmental Disabilities Research Reviews*, 15, 193-199.
- Forray, A. (2016). Substance use during pregnancy. *F1000Research*, 5(F1000Faculty Rev), 887, 1-9. Doi: 10:12688/f1000research.7645.1
- Forray, A., Merry, B., Haiqun, L., Ruger, J.P., & Yonkers, K.A. (2015) Perinatal substance use: A prospective evaluation of abstinence and relapse. *Drug and Alcohol Dependence*, Retrieved March 6, 2015, from <http://www.sciencedirect.com/science/article/pii/S0376871615001118>. doi:10.1016/j.drugalcdep.2015.02.027
- Fullerton, C.A., Kim, M., Thomas, C.P., Lyman, D.R., Montejano, L.B., Dougherty, R.H., ... Delphin-Rittmon, M.E. (2014). Medication-assisted treatment with methadone: Assessing the evidence. *Psychiatric Services*, 65(2), 146-157. doi: 10.1176/appi.ps.201300235
- Gaffney, A. (2014, December 3). FDA scraps pregnancy labeling classification system in favor of new standard. Retrieved June 8, 2016, from <http://www.raps.org/Regulatory-Focus/News/2014/12/03/20893/FDA-Scraps-Pregnancy-Labeling-Classification-System-in-Favor-of-New-Standard/>.
- Gibbons, P., Marcus, S., Muzik, M., Hamilton, S., McDonough, S., Mozurkewich, El, ..., & Treadwell, M.C. (2010). Partnering for progress: A comprehensive intervention to provide optimal access and comprehensive care to mothers with substance use disorders and their babies. *The Source*, 20(2), 1-6. Berkley, CA: National Abandoned Infants Assistance Resource Center (NAIARC).
- Golden, J. & Finkel, A. (2005). Message in a bottle: The making of fetal alcohol syndrome. *Labour*, 56, 325.

- Good, M.M., Solt, I., Acuna, J.G., Rotmensch, S., & Kim, M.J. (2010). Methamphetamine use during pregnancy: Maternal and neonatal implications. *Obstetrics & Gynecology*, 116(2), 330-334.
- Goodwin, R.S., Wilkins, D.G., Averin, O., Choo, R.E., Schroeder, J.R., Jasinski, D.R., Johnson, R.E. ... & Huestis, M.A. (2007). Buprenorphine and norbuprenorphine in hair of pregnant women and their infants after controlled buprenorphine administration. *Clinical Chemistry*, 53(12), 2136-2143.
- Green, C. (2006). Gender and use of substance abuse treatment services. NIDA. Retrieved June 10, 2016, from <http://pubs.niaaa.nih.gov/publications/arh291/55-62.htm>.
- Greenfield, S.F., Back, S.E., Lawson, K., & Brady, K.T. (2010). Substance abuse in women. *Psychiatric Clinics of North America*, 33(2), 339–355. doi:10.1016/j.psc.2010.01.004
- Grotta, S.D., LaGasse, L.L., Arria, A.M., Derauf, C., Grant, P., Smith, L.M., ... Lester, B.M. (2010). Patterns of methamphetamine use during pregnancy: Results from the infant development, environment, and lifestyle (IDEAL) study. *Maternal Child Health Journal*, 14, 519-527.
- Guttmacher Institute. (2016). State policies in brief as of March 1, 2016: Substance abuse during pregnancy. Retrieved June 8, 2016, from https://www.guttmacher.org/sites/default/files/pdfs/spibs/spib_SADP.pdf.
- Heil, S.H., Jones, H.E., Arria, A., Kaltenbach, K., Coyle, M., Fischer, G., ... , Martin, P.R. (2011). Unintended pregnancy in opioid-abusing women. *Journal of Substance Abuse Treatment*, 40(2), 199-202. doi:10.1016/j.jsat.2010.08.011
- Howell, H.B., Shao, L., & Yonkers, K.A. (2010). Who uses when they're pregnant? Screening pregnant women for drug and alcohol use. *The Source*, 20(2), 12-16. Berkley, CA: National Abandoned Infants Assistance Resource Center (NAIARC).
- Institute for Research, Education, and Training in Addictions (IRETA). (2014, January 7). We know a lot about treating pregnant opioid users and we're still losing ground: Lack of screening, access and coordinated care hinder the implementation of effective treatment. Retrieved December 3, 2015, from <http://ireta.org/2014/01/07/we-know-a-lot-about-treating-pregnant-opioid-users-and-were-still-losing-ground/>.
- Irner, T.B., Teasdale, T.W., Nielsen, T., Vedal, S., & Olofsson, M. (2012). Substance use during pregnancy and postnatal outcomes. *Journal of Addictive Disorders*, 31(1), 19-28. doi: 10.1080/10550887.2011.642765
- Ismail, S., Buckley, S., Budacki, R., Jabbar, A., & Gallicano, G.I. (2010). Screening, diagnosing and prevention of fetal alcohol syndrome: Is this syndrome treatable? *Developmental Neuroscience*, 32, 91-100. doi: 10.1159/000313339
- Jensen, C.L. (2014, June). Improving outcomes for infants with NAS. myCME.com. Retrieved June 17, 2014, from <http://www.mycme.com/improving-outcomes-for-infants-with-nas/material/1849/6884/>.
- Jones, H.E., Heil, S.H., Baewert, A., Arria, A.M., Kaltenbach, K., Martin, P.R., Stine, S.M., Coyle, M.G., ... Fischer, G. (2010). Buprenorphine treatment of opioid- dependent pregnant

- women: A comprehensive review. *Addiction*, 107, Supplement 1, 5-27. doi: 10.1111/j.1360-0443.2012.04035.x
- Karila, L., Weinstein, A., Aubin, H., Benyamina, A., Reynaud, M., & Batki, S.L. (2010). Pharmacological approaches to methamphetamine dependence: A focused review. *British Journal of Clinical Pharmacology*, 69(6), 578-592. doi: 10.1111/j.1365-2125.2010.03639.x
- Keegan, J., Parva, M., Finnegan, M., Gerson, A., & Belden, M. (2010). Addiction in pregnancy. *Journal of Addictive Diseases*, 29(2), 175-191. doi:10.1080/10550881003684723
- Kelly, L., Minty, B., Madden, S., Dooley, J., & Antone, I. (2011). The occasional management of narcotics exposure in neonates. *Canadian Journal of Rural Medicine*, 16(3), 98-101
- Klinger, G., Frankenthal, D., Merlob, P., Diamond, G., Sirota, L., Levinson-Castiel, R., ... Inbar, D. (2011). Long-term outcome following selective serotonin reuptake inhibitor induced neonatal abstinence syndrome. *Journal of Perinatology*, 31, 615-620.
- Kvigne, V.L., Leonardson, G.R., Borzelleca, J., & Welty, T.K. (2008). Characteristics of grandmothers who have grandchildren with fetal alcohol syndrome or incomplete fetal alcohol syndrome. *Maternal Child Health Journal*, 12, 760-785. doi: 10.1007/s10995-007-0308-y
- Lacroix, I., Hammou, Y., & Montrastruc, J. (2011). Buprenorphine versus methadone in pregnant opioid-dependent women: A prospective multicenter study. *European Journal of Clinical Pharmacology*, 67, 1053-1059. DOI: 10.1007/s00228-011-1049-9
- Lewis, B.A., Minnes, S., Short, E.J., Min, M.O., Wu, M., Lang, A., ... Singer, L.T. (2013). *Journal of Speech, Language, and Hearing Research*, 56, 1662-1676.
- Lin, J., Chan, Y., & Chen, Y. (2012). Acupuncture for the treatment of opiate addiction. *Evidence-Based Complementary and Alternative Medicine*, 2012, 1-10. doi:10.1155/2012/739045
- Manchikanti, L., Helm II, S., Fellows, B., Janata, J.W., Pampati, V., Grider, J.S., & Boswell, M.V. (2012). Opioid epidemic in the United States. *Pain Physician*, 15(3 Suppl), ES9-38.
- Mann, D. (2011, August 29). Snuff use during pregnancy is harmful to newborns. *WebMD News Archive*. Retrieved February 17, 2015, from <http://www.webmd.com/baby/news/20110826/snuff-use-during-pregnancy-harmful-to-newborns>.
- Massachusetts Department of Public Health Bureau of Substance Abuse Services (MDPHBSAS). (2011, May). Protecting women and babies from alcohol and drug affected births: Tools and resources. Retrieved May 31, 2014, from <http://massclearinghouse.ehs.state.ma.us/BSASGENPROG/SA3509.html>.

- Methamphetamines.com. (2013, March 8). Methamphetamine history. Retrieved February 17, 2015, from <http://methamphetamines.com/methamphetamine-history.html>.
- mothertobaby.org. (2014, December 3). New FDA ruling means more medication risk information for pregnant women. Retrieved February 16, 2015, from <http://mothertobaby.org/news-press/fda-ruling-means-medication-risk-information-pregnant-women-mothertobaby-offer-additional-support/>.
- mothertobaby.org. (2015, January 28). MotherToBaby lands federal funding to expand services: Approximately 50% of women report taking at least one medication during pregnancy. Retrieved February 16, 2015, from [http://www.pregnancyrisknetwork.org/PDF/HRSA%20Announcement%20Press%20Release_Membership%20\(2\).pdf](http://www.pregnancyrisknetwork.org/PDF/HRSA%20Announcement%20Press%20Release_Membership%20(2).pdf).
- Musto, D.F. (1991). Opium, cocaine, and marijuana in American history. *Scientific American*, 20-27.
- Narconon. (n.d.). History of methamphetamine. Retrieved August 20, 2016, from <http://www.narconon.org/drug-information/methamphetamine-history.html>.
- National Abandoned Infants Assistance Resource Center (NAIARC). (2012, March). Prenatal substance exposure fact sheet. Retrieved January 16, 2015, from http://aia.berkeley.edu/media/pdf/AIAFactSheet_PrenatalSubExposure_20_12.pdf.
- National Institute on Drug Abuse (NIDA). (2012, June). NIDA research report series: Tobacco addiction. Retrieved February 5, 2015, from http://www.drugabuse.gov/sites/default/files/tobaccorrs_v16.pdf.
- National Institute on Drug Abuse (NIDA). (2013, September). NIDA research report series: Methamphetamine. Retrieved July 10, 2014, from NIDA Web site: <http://www.drugabuse.gov/sites/default/files/methrrs.pdf>.
- National Institute on Drug Abuse (NIDA). (2014, December). DrugFacts: Cigarettes and other tobacco products. Retrieved January 25, 2015, from http://www.drugabuse.gov/sites/default/files/drugfacts_cigarettes_12_2014_2.pdf.
- National Institute on Drug Abuse (NIDA). (2015, September). Substance use in women. *DrugFacts*. Bethesda, MD: Author. Retrieved June 10, 2016, from https://www.drugabuse.gov/sites/default/files/substanceusewomen_drugfacts_final_09032015.pdf.
- National Institute of Mental Health (NIMH). (2012). *Mental health medications*. Bethesda, MD: Author.
- National Institutes of Health/National Institute on Alcohol Abuse and Alcoholism/National Organization on Fetal Alcohol Syndrome (NIH/NIAAA/NOFAS). (2012). When you are pregnant, drinking can hurt your baby. NIH Publication No. 96-4101. Retrieved July 11, 2014, from http://pubs.niaaa.nih.gov/publications/drinkingpregnancy_html/pregnancy.pdf.

- National Institutes of Health and the National Institute on Alcohol Abuse and Alcoholism (NIH/NIAAA). (2015). Helping patients who drink too much: A clinician's guide. Retrieved December 14, 2015, from <http://pubs.niaaa.nih.gov/publications/Practitioner/CliniciansGuide2005/guide.pdf>.
- Nelson, M.M. (2013). Neonatal abstinence syndrome: The nurse's role. *International Journal of Childbirth Education*, 28(1), 38-42.
- NTI Upstream Web site. (n.d.). Retrieved February 27, 2015, from <http://www.ntiupstream.com/>.
- NTI Upstream. (n.d.). The 4P's Plus© screen for substance use in pregnancy: Research background and clinical application. Retrieved February 27, 2015, from http://static1.squarespace.com/static/5305a53ee4b0be631aa0cb80/t/530fcac8e4b0d21c52988781/1393543880517/The_4P%27s_Plus.pdf.
- Núñez, S.C., Roussotte, F., & Sowell, E.R. (2011). Focus on: Structural and functional brain abnormalities in fetal alcohol spectrum disorders. *Alcohol Research & Health*, 34(1), 121-131.
- O'Brien, P.L. (2012) Ego-dystonic pregnancy and prenatal consumption of alcohol among first-time mothers. *Maternal Child Health Journal*, 16, 1431-1439. DOI: 10.1007/s10995-011-0907-5
- Oei, J.L., Kingsbury, A., Dhawan, A., Burns, L., Feller, J.M., Clews, S., ... & Abdel-Latif, M.E. (2012). Amphetamines, the pregnant woman and her children: A review. *Journal of Perinatology*, 32, 737-747.
- Organization of Teratology Information Specialists (OTIS). (2013, June). Methamphetamine and pregnancy. Retrieved February 16, 2015, from <http://www.mothersbaby.org/files/Methamphetamine.pdf>.
- Organization of Teratology Information Specialists (OTIS). (2014a, May). Cocaine and pregnancy. Retrieved February 16, 2015, from <http://www.mothersbaby.org/files/cocaine.pdf>.
- Organization of Teratology Information Specialists (OTIS). (2014b, June). Cigarette smoking and pregnancy. Retrieved February 16, 2015, from <http://www.mothersbaby.org/files/Cigarettesmoking.pdf>.
- Organization of Teratology Information Specialists (OTIS). (2014c, September). Prescription opioids and pregnancy. Retrieved February 16, 2015, from http://www.mothersbaby.org/files/Prescription_Opioids.pdf.
- Organization of Teratology Information Specialists (OTIS). (2015, January). Marijuana and pregnancy. Retrieved February 16, 2015, from <http://www.mothersbaby.org/files/marijuana.pdf>.
- Organization of Teratology Information Specialists (OTIS). (2016, February). Methamphetamine/Dextroamphetamine and pregnancy. Retrieved February 16, 2016, from <http://mothersbaby.org/fact-sheets/methamphetaminedextroamphetamine-pregnancy/pdf/>.

- Patnode, C.P., Henderson, J.T., Thompson, J.H., Senger, C.A., Fortmann, S.P., & Whitlock, E.P. (2015). *Behavioral counseling and pharmacotherapy interventions for tobacco cessation in adults, including pregnant women: A review of reviews for the U.S. preventive services task force*. Evidence Synthesis No. 134. AHRQ Publication No. 14-05200-EF-1. Rockville, MD: Agency for Healthcare Research and Quality, 1-209.
- Petit, A., Karila, L., Chalmin, F., & Lejoyeux, M. (2012). Methamphetamine addiction: A review of the literature. *Journal of Addiction Research and & Therapy*, S1:006, 1- 6. doi:10.4172/2155-6105.S1-006
- Prasad, M. (2014, February 1). When opiate abuse complicates pregnancy. *Contemporary OB/GYN eNews*.
- Racine, A., Joyce, T., & Anderson, R. (1993). The association between prenatal care and birth weight among women exposed to cocaine in New York City. *Journal of the American Medical Association*, 270(13), 1581-1586.
- Ramo, D.E. & Brown, S.A. (2008). Classes of substance abuse relapse situations: A comparison of adolescents and adults. *Psychology of Addictive Behaviors*, 22(3), 372-379. doi: [10.1037/0893-164X.22.3.372](https://doi.org/10.1037/0893-164X.22.3.372)
- Sanz, E.J., & De las Cuevas, C. (2006). Psychopharmacologic therapy in pregnancy: Effects on newborns. *Psychiatric Times*, 23(7), 1-5.
- Silverstein, J.H., Rieders, M.F., McMullin, M., Schulman, S., & Zahl, K. (1993). An analysis of the duration of fentanyl and its metabolites in urine and saliva. *Anesthesia & Analgesia*, 76(3), 618-621.
- Smith, M.O. (2012). The use of acupuncture in addiction treatment programs. Retrieved February 20, 2014, from http://www.huffingtonpost.com/dr-michael-o-smith/addiction-acupuncture_b_1665796.html.
- Soyka, M. (2013). Buprenorphine use in pregnant opioid users: A critical review. *CNS Drugs*, 27, 653-662. doi: 10.1007/s40263-013-0072-z
- Stewart, J. (2015, November 30). Report shows meth's popularity grew in county: More users are saying the dangerous stimulant is their favorite drug. Retrieved August 25, 2016, from <http://www.sandiegouniontribune.com/news/2015/nov/30/meth-becoming-more-popular-in-san-diego/>.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2013). *Substance abuse treatment: Addressing the specific needs of women: Treatment improvement protocol (TIP) series 51*. Department of Health and Human Services (DHHS) Publication No. (SMA) 13-4426. Rockville, MD: SAMHSA.
- Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment (SAMHSA/CSAT). (2009). *Incorporating alcohol pharmacotherapies into medical practice: Treatment improvement protocol (TIP) series 49*. Department of Health and Human Services (DHHS) Publication No. (SMA) 09-4380. Rockville, MD: SAMHSA.

- Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, Division of Pharmacologic Therapies (SAMHSA/CSAT/DPT). (2015, March). Federal guidelines for opioid treatment. Retrieved April 1, 2015, from <http://store.samhsa.gov/shin/content/PEP15-FEDGUIDEOTP/PEP15-FEDGUIDEOTP.pdf>.
- Substance Abuse and Mental Health Services Administration, Office of Applied Studies (SAMHSA/OAS). (2009). The NSDUH report: Substance use among women during pregnancy and following childbirth. Rockville, MD: Author.
- The Partnership at Drugfree.org. (n.d.). Medication-assisted treatment: An e-book for parents & caregivers of teens & young adults addicted to opioids. Retrieved March 3, 2016, from http://www.drugfree.org/wp-content/uploads/2014/05/MAT_EBOOK_2014v2.pdf.
- Thigpen, J. & Melton, S.T. (2014). Neonatal abstinence syndrome: A challenge for medical providers, mothers, and society. *Journal of Pediatric Pharmacology and Therapeutics*, 19(3), 144-146.
- United States Food and Drug Administration (FDA). (2014a, December 3). Pregnancy and lactation labeling (drugs) final rule. Retrieved June 8, 2016, from <http://www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/Labeling/ucm093307.htm>.
- United States Food and Drug Administration (FDA). (2014b, December 3). Summary of proposed rule on pregnancy and lactation labeling. Retrieved June 8, 2016, from <https://www.gpo.gov/fdsys/pkg/FR-2008-05-29/pdf/E8-11806.pdf>.
- United States Food and Drug Administration (FDA). (2012, January 9). FDA drug safety communication: Selective serotonin reuptake inhibitor (SSRI) antidepressant use during pregnancy and reports of a rare heart and lung condition in newborn babies. Retrieved March 6, 2015, from <http://www.fda.gov/Drugs/DrugSafety/ucm283375.htm>.
- United States Government Accountability Office (GAO). (2015, February 10). Prenatal drug use and newborn health: Federal efforts need better planning and coordination. (Publication No. GAO-15-203). Washington, DC: U.S. Government Printing Office. Retrieved March 14, 2015, from <http://gao.gov/products/GAO-15-203>.
- Warren, K.R., Hewitt, B.G., & Thomas, J.D. (2011). Fetal alcohol spectrum disorders: Research challenges and opportunities. *Alcohol Research & Health*, 34(1), 4-14.
- Warren, M.D. & Luskin, K. (2012). Tennessee efforts to prevent neonatal abstinence syndrome. Tennessee Department of Health.
- Washington State Department of Social and Health Services Division of Behavioral Health and Recovery (WSDSHS/DBHR). (1997). Helping patients with drug use disorders: resources for medical professionals. Retrieved June 19, 2016, from <https://www.dshs.wa.gov/sites/default/files/BHSIA/dbh/documents/CD%20ScreeningGuideforMedicalProf.pdf>.
- Watson, E. (2010). The evolution and application of the 5 P's Behavioral Risk Screening Tool. *The Source*, 20(2), 27-29. Berkeley, CA: National Abandoned Infants Assistance Resource Center

(NAIARC).

- Wiegand, S.L., Stringer, E.M., Stuebe, A.M., Jones, H., Seashore, C., & Thorp, J. (2015). Buprenorphine and naloxone compared with methadone treatment in pregnancy. *Obstetrics & Gynecology*, 125(2):363-8. doi: 10.1097/AOG.0000000000000640
- Wilner, A.A. (2010, April 19). Which antiepileptic drug is safest in pregnancy? Medscape. Retrieved March 6, 2015, from <http://www.medscape.com/viewarticle/720066>.
- Wilsnack, S.C., Wilsnack, R.W., & Kantor, L.W. (2013). Focus on: Women and the costs of alcohol use. *Alcohol Research: Current Reviews*, 35(2), 219-228.
- Wong, S., Ordean, A., & Kahan, M. (2011). Substance use in pregnancy. *Journal of Obstetrics and Gynaecology Canada*, 33(4), 367-384.
- World Health Organization (WHO). (2014). Guidelines for the identification and management of substance use and substance use disorders in pregnancy. Geneva, Switzerland: Author.
- Wright, T.E., Schuetter, R., Fombonne, E., Stephenson, J., & Haning III, W.F. (2012). Implementation and evaluation of a harm-reduction model for clinical care of substance using pregnant women. *Harm Reduction Journal*, 9(5), 1-10.

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