Marijuana Use during Pregnancy and Lactation

The National Association of Nurse Practitioners in Women's Health (NPWH) advocates for a nonjudgmental and evidence-based approach to screening and counseling women concerning marijuana use during pregnancy and lactation. NPWH supports strategies to educate the public about safety concerns and to reduce marijuana use during pregnancy and lactation. Legislation, policies, and clinical processes should ensure that women who use marijuana have access to nonjudgmental, nonpunitive, person-centered healthcare throughout pregnancy, birth, and the postpartum period. NPWH supports ongoing research on the effects of marijuana use on fetal and neonatal outcomes, long-term effects on neurodevelopment, and safety of use during breastfeeding.

Background

Marijuana is now legal for medical and/or recreational use in more than half of states. Changes in the legal status of marijuana have led to an increase in use and a decline in perceived risks. In 2018, the percentage of the US general population age 12 years and older who used marijuana was higher than the percentages from 2002 to 2017. The percentage of the population in 2018 who perceived great risk of harm from weekly marijuana use was lower than the percentages from 2015 to 2017.

The increase in use of marijuana extends to pregnant women. Between 2002 and 2017, the prevalence of marijuana use increased from 3.4% to 7.0% among pregnant women. Reported use was higher for the first trimester than for the second and third trimesters. First-trimester marijuana use increased from 5.7% in 2002 to 12.1% in 2017. Pregnant women have reported using marijuana to treat nausea, help with depression and anxiety, and to relieve pain.

Animal studies confirm that the main psychoactive component of marijuana, delta-9-tetrahydrocannabinol (THC), readily crosses the placenta and enters fetal plasma. Slow fetal clearance may result in prolonged fetal exposure to THC. Higher concentrations are observed after repetitive exposures. Human studies show THC is secreted into breast milk in small amounts, with variable reports on duration of detection ranging from 6 days to 6 weeks.

Although available data concerning the effects of in utero exposure to marijuana on fetal and neonatal outcomes as well as long-term effects on neurodevelopment are not conclusive, some emerging trends warrant concern. Data are insufficient to evaluate the effects of marijuana use on infants during breastfeeding. Because of uncertainties, women who use marijuana and are pregnant or lactating should be encouraged to discontinue marijuana use.

Marijuana pharmacokinetics and pharmacodynamics

Marijuana is the dried component of the cannabis plant. It is consumed through smoking, eating, vaping, and dabbing. Cannabis plants produce more than 400 chemical entities (cannabinoids), including the main psychoactive component THC.

THC is absorbed from the lungs when marijuana is smoked, vaped, or dabbed or absorbed from the gastrointestinal tract when ingested and is distributed rapidly to the brain and fat tissues. THC molecules cross the blood–brain barrier and activate cannabinoid receptor type 1 (CB1) located in the reward center of the brain. Psychoactive effects include heightened sympathetic activity, increased cardiac output, deterioration of motor coordination, and immunosuppression. THC is metabolized in the liver and has a half-life in blood that varies from 20 to 36 hours in the occasional user to 4 to 5 days in heavy users. It has a half-life of approximately 8 days in fat deposits. Because of THC’s lipophilic characteristics and its long half-life in fat deposits, THC may be detected in blood samples for as long as 30 days after use.

Marijuana use and adverse fetal and neonatal outcomes

Few well-designed studies have reviewed fetal and neonatal outcomes correlated with marijuana use during pregnancy. Those that do exist are conflicting and conclusions are limited by reliance on self-reporting of marijuana use and confounding factors such as high rates of concomitant tobacco use, polysubstance use, and socioeconomic factors.

One systematic review with meta-analysis of 24 studies focused on the effects of marijuana use during pregnancy on maternal, fetal, and neonatal outcomes. The fetal and neonatal findings of the meta-analysis demonstrated that...
neonates exposed to marijuana in utero had a decreased birth weight and were more likely to require admission to a neonatal intensive care unit (NICU) than those without the exposure. No association was found between in utero marijuana exposure and intrauterine growth restriction, decrease in head circumference, Apgar scores, or preterm birth. This systematic review did not adjust for concurrent use of tobacco or alcohol in the meta-analysis.

Another systematic review with meta-analysis of 31 studies focused on marijuana use during pregnancy and incidence of adverse neonatal outcomes. In this meta-analysis, the pooled data adjusted for tobacco use and other confounding factors. The pooled adjusted estimates demonstrated no statistically significant increased risk for low birth weight, admission to a NICU, or preterm birth related to use of marijuana during pregnancy. The researchers concluded that the association between marijuana use during pregnancy and adverse neonatal outcomes may be attributed to concomitant tobacco use and other confounding factors rather than to marijuana use alone.

Findings from smaller studies are conflicting regarding the impact of concomitant marijuana and tobacco use during pregnancy on neonatal outcomes. One retrospective cohort study found that while marijuana use alone during pregnancy was not associated with increased adverse neonatal outcomes, the concurrent use of tobacco and marijuana was associated with decreased birth weight, decreased head circumference, and preterm birth. A cross-sectional study using data from a statewide population survey found an association between marijuana use during pregnancy and increased risk for low birth weight. After adjustment for tobacco use, the incidence of low birth weight was attenuated, but it was still statistically significant.

Currently available evidence does not support that marijuana use during pregnancy causes structural anatomic defects in humans. Additionally, current evidence does not demonstrate any association between marijuana use in pregnancy and perinatal mortality.

Marijuana use and long-term neurodevelopmental effects
Humans have an endocannabinoid system and can produce their own cannabinoids. These endogenous cannabinoids are released in reaction to specific CB1 receptor agonists that are produced only when and where they are needed and are rapidly removed by a membrane transport system. When endogenous cannabinoids are produced and released, various excitatory or inhibitory neurotransmitter systems are inhibited.

The growing evidence that endocannabinoid deficiency or hypofunction may contribute to some medical conditions has spurred the use of exogenous cannabinoids (ie, marijuana, THC) to treat aspects of these conditions. As examples, exogenous cannabinoids are used to manage symptoms related to cancer or cancer treatment, perceptions of muscle spasticity in individuals with multiple sclerosis, and symptoms associated with post-traumatic stress disorder.

Both animal and human studies have demonstrated the importance of endocannabinoid signaling for normal fetal development. The number of CB1 receptors is substantially higher in fetal brains compared with adult brains suggesting a role for endocannabinoids in normal brain development. In utero exogenous cannabinoid exposure can disrupt endocannabinoid signaling, and it has been shown to disrupt normal brain development and function in animal studies.

It is difficult to ascertain the specific neurodevelopmental effects of antenatal marijuana exposure in humans due to frequent concurrent use of other substances including alcohol, tobacco, and illicit drugs. Pregnant and nonpregnant tobacco smokers, alcohol drinkers, and users of illicit drugs are 2 to 3 times more likely to use marijuana. Environmental and sociodemographic variables also may contribute to adverse neurodevelopmental outcomes otherwise attributed to marijuana.

A limited number of longitudinal studies in children with known antenatal marijuana exposure, however, suggest an association with attention span problems, behavioral problems, lower scores on tests of visual problem solving, and visual–motor coordination. There is also concern that antenatal exposure to marijuana can potentiate brain susceptibility that may result in a risk for polysubstance abuse in offspring.

Marijuana use and maternal health
In addition to the concern regarding the effect marijuana use may have on fetal and neonatal outcomes and neurodevelopment, it is important to also recognize associated health risks for the mother. Although data are limited, studies have found an association between maternal marijuana use and increased risk for anemia, excess gestational weight gain, less than daily prenatal vitamin use, food insecurity, and high number of stressors.

Data indicate that regardless of pregnancy status, women who use tobacco, alcohol, and/or illicit drugs are more likely to have also used marijuana in the previous year. Women who continue to use marijuana during...
pregnancy are more likely to also use tobacco.\textsuperscript{4,8} Evaluation and counseling for polysubstance use is relevant when a woman, pregnant or not, reports marijuana use. Substance dependence is also a potential risk for women who use marijuana. In one study, approximately 18% of pregnant women and 11% of nonpregnant women who used marijuana in the past year met the \textit{Diagnostic and Statistical Manual of Mental Disorders} (DSM)-IV criteria (study conducted prior to publication of DSM-5) for substance abuse and/or dependence.\textsuperscript{16}

**Implications for women’s healthcare and nurse practitioner practice**

Nurse practitioners (NPs) should ask all women who are pregnant or planning a pregnancy about marijuana use as part of routine tobacco, alcohol, and other substance use screening. Women who report marijuana use should be counseled about potential harms of use during pregnancy and advised to discontinue use while pregnant. NPs should be aware of an increased risk for marijuana use in women who are abusing tobacco, alcohol, or other illicit drugs when inquiring about substance use to obtain a full understanding of the extent of risks.\textsuperscript{16} Information about the possible additive adverse effects of combined tobacco and marijuana use should be provided.

Pregnant women who report using marijuana for nausea, anxiety, depression, or pain should be offered safe, evidence-based, effective alternative treatments. There are no data to support the efficacy of marijuana for nausea and vomiting of pregnancy. Given the potential harmful effects for the fetus, marijuana should not be recommended as a treatment for pregnant women.\textsuperscript{5}

NPs who provide prenatal care have the unique opportunity to have repeated interactions with patients throughout pregnancy and can provide follow-up on marijuana use as needed. An ongoing nonjudgmental and supportive approach can foster a therapeutic, person-centered relationship. When marijuana or other substance dependency is identified, the NP should provide referrals for specialized help.

NPs must be aware of substance use testing and reporting requirements in their state or community. While state legislation may protect adults who use marijuana, state and community policies vary regarding testing for substance use in pregnant women and mandatory reporting. The fact that marijuana remains a Schedule I drug on the federal level further complicates consequences surrounding testing for substance use in pregnancy. Patients should be informed of existing reporting requirements and potential ramifications. NPs should advocate for the retraction of legislation that exposes pregnant women with substance use disorders to criminal or civil penalties.\textsuperscript{17,18}

Counseling should continue in the postpartum period to ensure that the patient is aware of the possible risks of breastfeeding and concurrent marijuana use. NPs should be cautious, however, about discouraging breastfeeding. The American College of Obstetricians and Gynecologists, American Academy of Pediatrics, and Academy of Breastfeeding Medicine recommend encouraging mothers to abstain from marijuana use while breastfeeding. They also note that data are not strong enough at this time to recommend not breastfeeding.\textsuperscript{11–13} Women should be supported in abstaining or decreasing marijuana use while breastfeeding.

NPWH will provide leadership to ensure that:

- Continuing education programs and other evidence-based resources are available to NPs to learn and update knowledge regarding screening, patient education, and counseling to discontinue marijuana use during pregnancy and lactation.
- NPs are equipped with consistent, clear, up-to-date messaging regarding the risks associated with marijuana use during pregnancy and lactation.
- NPs have the resources needed to advocate for public awareness initiatives that educate the public about safety concerns and to reduce marijuana use during pregnancy and lactation.
- Research on fetal and neonatal outcomes and long-term neurodevelopmental effects of maternal use of marijuana during pregnancy and lactation is encouraged and supported.
- Legislators and other policy makers have information regarding evidence-based, nonpunitive strategies to address the needs of pregnant women with substance use disorders.

**References**

4. Mark K, Gryczynski J, Axenfeld E, et al. Pregnant wom-


