



## **Marijuana and the Impact on the Pediatric Population (including Perinatal and Adolescent)**

### **Guidance for Healthcare Providers**

#### ***What is Marijuana?***

There are many species of marijuana, including *Cannabis sativa*, *indica* and *ruderalis*. Marijuana contains many different cannabinoids, including cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC). THC is the most psychoactive cannabinoid.

#### ***Products and Methods of Use***

Marijuana is available in various forms: traditional dried plant matter, dried plant resin (hashish), concentrated oils and other products (shatters, budders, waxes). Edible marijuana products, like baked goods and candies are infused with THC. Marijuana plants can contain a range of 6-30% THC and concentrated products can be much higher in potency (including > 50%). Marijuana can be smoked, vaporized, ingested and applied topically.

#### ***Content and Testing***

Many states that have allowed marijuana for medical and retail use regulate testing for both content and contaminants. However, without FDA approval testing and results can be variable. Therefore, the FDA has released warnings pertaining to test results and false claims on several cannabidiol products.[3] [4,5]

#### ***Epidemiology***

The 2016 National Survey on Drug Use and Health (NSDUH) found [6]:

- Over 4% of women surveyed admitted to drug use in pregnancy and marijuana was the most commonly used substance Almost 1,000 exposure calls to US poison centers occurred between 2005 and 2011 for pediatric marijuana exposures in children 9 years and younger [7]
- Exposure rates have significantly increased in states that have legalized marijuana for medical or retail use (increase in 30% exposure calls per year)

According to the 2017 Monitoring the Future survey (MTF) [8]:

- Marijuana use by adolescents declined between late 1990s until the mid-to-late 2000s, but has increased since
- In 2017, 5.5% of 8th graders, 15.7% of 10th graders, and 22.9% of 12th graders used marijuana in the past month, an increase from 6%, 1%, and 19%, respectively, in 2008.
- Daily use remained relatively constant at approximately 3%.

The Substance Abuse and Mental Health Services Administration (SAMHSA) has estimated:

- In 2014, approximately, 7% or 1.8 million youth between 12 to 17 years used marijuana in the past month .[3]
- Perceived risk from once-monthly use has decreased from 55% in 2005, to 44.8% in 2011.[9]

### ***Clinical Symptoms***

Absorption of THC is rapid after inhalation and peak concentrations of cannabinoids and psychoactive symptoms occurs within minutes. After ingestion, however absorption can be unpredictable because cannabinoids are unstable at gastric pH and also undergo first-pass metabolism (CYP 2C9, 3A4). Onset of symptoms can vary between 1-3 hours, and concentrations can peak between 2-4 hours.[10]

The clinical effects of pediatric exposure to marijuana vary depending on the amount ingested and size of the child. Most reported pediatric exposures are from ingestion.[7,11] Edible products pose a significant risk as they contain high amounts of THC and are attractive and palatable to children. . Passive smoke inhalation can produce symptoms in adults, but has not been studied or reported in children. There is evidence of passive smoke exposure leading to detectable cannabinoids in the urine in children.[12]

Mild exposures can result in mild sleepiness, excessive happiness and laughter, and ataxia. Significant exposures can lead to increased muscle tone (or hyperkinetic activity), obtundation/coma, and apnea/bradypnea. Higher potency products can lead to anxiety, psychosis, and agitation in adolescence.

The clinical effects in pediatric population tend to last longer than adults, with some cases lasting 24-36 hours.

### ***Laboratory Testing***

Most standard hospital urine drug screens (UDS) are enzyme immunoassays for THC metabolites. Urine drug screens for marijuana can be positive for several days after acute use weeks after chronic use. A positive UDS does not correlate to symptoms or the level of intoxication but it does reveal systemic exposure. False positives are uncommon but confirmatory testing can be done with high-performance liquid chromatography with mass spectrometry (HPLC-MS) screen. Even though Marinol and Sativex, FDA-approved synthetic cannabinoid THC pharmaceutical products result in positive UDS other cannabinoids, such as, CBD and street synthetic THC may not result in a positive UDS. Positive UDS after passive inhalation of marijuana smoke is very rare but can occur after excessive smoking in small, confined spaces for prolonged periods. Routine lab work and radiography is typically unremarkable. .

### ***Treatment***

There is no specific antidote for marijuana intoxication. Treatment is symptomatic and supportive care. Young patients are at risk for falls, so proper fall precautions should be taken. Sedation and/or antipsychotics are indicated in adolescents who experience significant psychosis or anxiety.

### ***Why should we be concerned about adolescent use?***

The adolescent population is vulnerable in regards to drug and marijuana use. Previous studies have associated adolescent marijuana use with lower IQ scores, a greater likelihood to have impaired cognitive and academic abilities even after 28 days of abstinence, and a decreased likelihood of graduating high school and attaining a college degree.[13-18] They are also higher risk for having

psychotic symptoms and/or psychiatric disorders, like schizophrenia and are more likely to develop an addiction to other illicit drugs.[19-22]

***What are the concerns of maternal use during pregnancy and breastfeeding?***

Recent studies have demonstrated THC can be found in the breastmilk, even days after last use.[23,24] Large cohort studies have reported children with prenatal exposure to marijuana can have decreased IQ scores, cognitive function and academic ability, attention deficits, and decreased growth.[25-33] Research has also shown an association of low birth weight after controlling for concurrent tobacco use.[33]

***Strategies for Prevention***

Prevention continues to play a vital role in pediatric poisoning and toxicology. Several states have implemented regulations to lessen the impact of legalization. Regulations include, dose restrictions, child-resistant packaging requirements, warning labels, sanctions on marketing campaigns and/or attractive labeling, and restrictions on edible products. [34-36]

***Further Prevention Strategies for Parents and Caregivers:***

- Keep marijuana and marijuana-infused products out of the reach of children and/or in a separate locked container.
- Do not store marijuana-infused products with regular non-infused food products.
- Have conversations with your children about the differences between marijuana-infused and regular non-infused food products, similar to warning children about alcohol in the home.
- Have conversations with other caregivers for your children: family members, babysitters, nannies about the dangers of having marijuana products accessible to children. Ask if there are marijuana products in the home and ensure they are properly stored.

***How can we prevent adolescent marijuana use?***

From a healthcare perspective, drug use screening, including marijuana used for both recreational and medical purposes, is important and primary care visits and/or behavioral health evaluations present valuable opportunities for screening. The Substance Abuse and Mental Health Services Administration (SAMHSA) provides resources on prevention programs addressing both youth marijuana use and evidence-based prevention and treatment strategies, including their *At-A-Glance Resource Tool, Strategies and Interventions to Prevent Youth Marijuana Use*.

As parents, recognize the value of an open dialogue about drug abuse and become educated about the associated risks. Many experts stress the importance of creating an environment that encourages communication. Parents who use marijuana should be honest, but should be aware of the impact that their use and behavior have on children. There are several informative tools available to parents provided by Colorado.gov, Children’s Hospital Colorado, Seattle Children’s Hospital, National Institute of Drug Abuse, and SAMHSA, to name a few.[37-41]

Healthcare providers should maintain confidentiality screening adolescents for marijuana use.. If concerns exist for significant use or addiction, multiple screening tools are available to assess the impact, such as the CRAFFT behavioral screening tool. Healthcare providers should consider referral to addiction specialists or further treatment and evaluation if concerns exist on its impact on physical or mental health, or on social interactions.

***What are ways we can prevent mothers from using marijuana during pregnancy and post-delivery?***

Regular healthcare visits during pregnancy and postpartum provides great opportunities for OB/GYN physicians to discuss drug use. Focusing on the risks and potential harms to the fetus and newborn, emphasizing the impact on the future health, well-being, and cognitive development of the child. The American College of Obstetricians and Gynecologists discourages physician prescribing of marijuana, use of marijuana during pregnancy and postpartum in breastfeeding mothers.

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