Update on Substance Use Trends Impacting the Pediatric Population

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Children's Hospital Colorado

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Objectives

- Describe current substance use trends
- Recognize different settings in which infants and children are impacted by substance use
- Outline the dangers of drug and alcohol environments for children
- Outline the utility of different drug testing methodologies and the benefits, and limitations
- Formulate a multidisciplinary response to children endangered by substance use
- Describe the value of family centered approaches to ensure the safety, health and well-being of substance-exposed children and their caregivers

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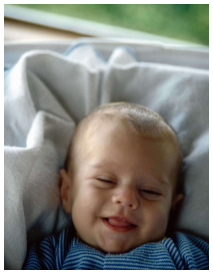
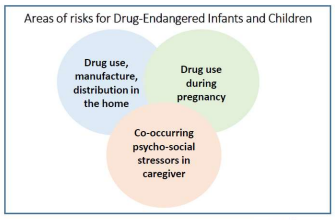
Substance Use and Infants/Children/Youth





(Source: Farst J and Wells KM. Drug Endangered Children. In Child Abuse: Medical Diagnosis and Management. 4th ed. Illinois: America Academy of Pediatrics (2019), eds. Antoinette Laskey and Andrew Sirotnak: 527-563)

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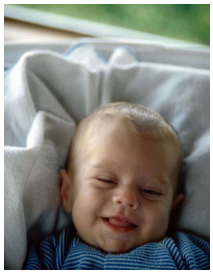
Substance Use and Infants/Children/Youth



Impact of current trends

- COVID pandemic
- Mental illness and substance use disorders
- Surging opioid use; fentanyl crisis
- Legalization of recreational marijuana

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COVID-19 Impact

COVID-19 brought:

- Great fear of illness/death from the virus
- Loss of familiar daily structure
- Isolation
- New expectations: home schooling and daycare provision
- Unemployment/stress of trying to find employment
- Financial stress
- Inability to get regular "non-essential" medical care and follow up
- Increases in domestic violence and child abuse

SAMHSA

Substance Abuse and Mental Health Services Administration

Expect substantial increases in substance use disorders, mental illness, and suicidality in all age groups

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Changes in Excessive Drinking during COVID-19 between February and April, United States

- Alcohol use, including excessive drinking, increased nationally during COVID-19
  - Average drinks per day increased 27%
  - Binge drinking increased by 26%
- Largest increases in excessive drinking were observed in the Western US
- Significant increases among women, Black adults and people with children

Created by CDPHE, Alcohol Epidemiology
Sources: Barbosa, C, Cowell, A, Dowd, W. How Has Drinking Behavior Changed During the COVID-19 Pandemic? Results from a Nationally Representative survey. RTI International, July 2020. World Health Organization, Fact sheet - Alcohol and COVID-19: what you need to know (2020).

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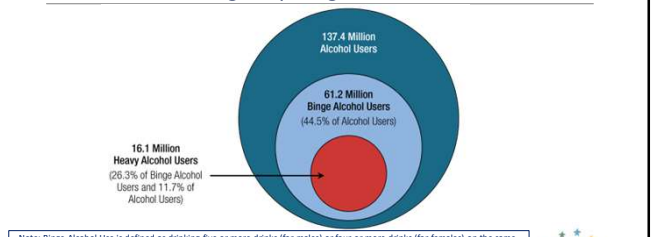
Past Month Alcohol Use, Binge Alcohol Use, or Heavy Alcohol Use: Among People Aged 12 or Older; 2022



Note: Binge Alcohol Use is defined as drinking five or more drinks (for males) or four or more drinks (for females) on the same occasion on at least 1 day in the past 30 days. Heavy Alcohol Use is defined as binge drinking on the same occasion on 5 or more days in the past 30 days; all heavy alcohol users are also binge alcohol users.

(Source: National Survey on Drug Use and Health, 2019)

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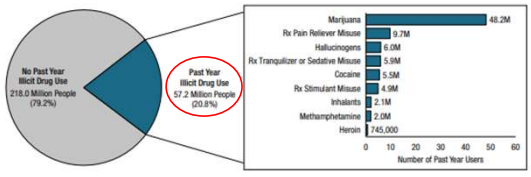
Past Year Illicit Drug Use among People Aged 12 or Older: 2019



Rx = prescription.
Note: The estimated numbers of past year users of different illicit drugs are not mutually exclusive because people could have used more than one type of illicit drug in the past year.

(Source: National Survey on Drug Use and Health, 2019)

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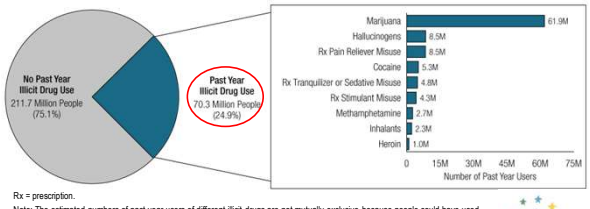
Past Year Illicit Drug Use: Among People Aged 12 or Older; 2022



Rx = prescription.
Note: The estimated numbers of past year users of different illicit drugs are not mutually exclusive because people could have used more than one type of illicit drug in the past year.

(Source: National Survey on Drug Use and Health, 2022)

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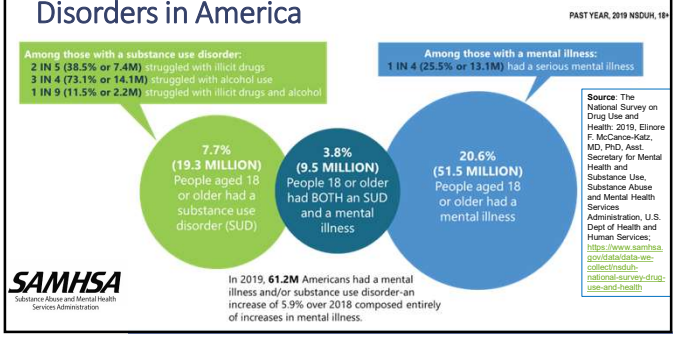
Mental Illness and Substance Use Disorders in America



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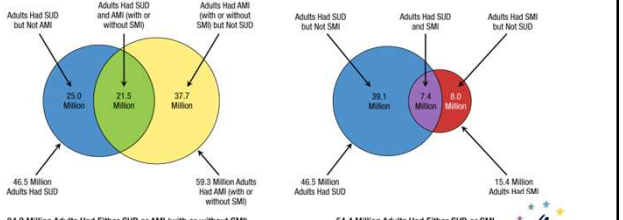
Past Year Substance Use Disorder (SUD), Any Mental Illness (AMI), and Serious Mental Illness (SMI): Among Adults Aged 18 or Older; 2022



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Substance Abuse and Mental Health Services Administration

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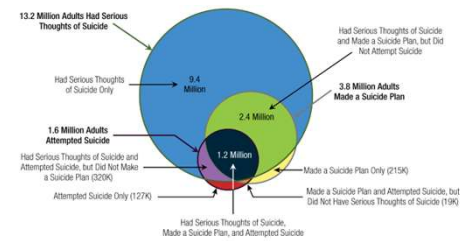
Adults Aged 18 or Older with Serious Thoughts of Suicide, Suicide Plans, or Suicide Attempts in the Past Year; 2022



13.6 Million Adults Aged 18 or Older Had Serious Thoughts of Suicide, Made a Suicide Plan, or Attempted Suicide in the Past Year

(Source: National Survey on Drug Use and Health, 2022)

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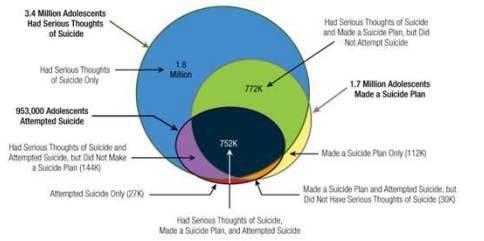
Youths Aged 12 to 17 with Serious Thoughts of Suicide, Suicide Plans, or Suicide Attempts in the Past Year; 2022



3.6 Million Adolescents Aged 12 to 17 Had Serious Thoughts of Suicide, Made a Suicide Plan, or Attempted Suicide in the Past Year

(Source: National Survey on Drug Use and Health, 2022)

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National Drug Trends (Seizures)

- Methamphetamine reports increased from 2008 through early 2019; decreased through first half of 2020, increased again first half of 2021, decreased first half of 2022
- Fentanyl reports remained steady from 2008 through early 2013, then increased significantly from first half 2014 through 2022
- Cannabis/THS reports slightly increased from 2008 to early 2010 then decreased through early 2022
- Xylazine is a tranquilizer that is increasingly being found in the US illegal drug supply and linked to overdose deaths

[Source: National Forensic Laboratory Information System (NFLIS), U.S. Department of Justice Drug Enforcement Administration (2022)]

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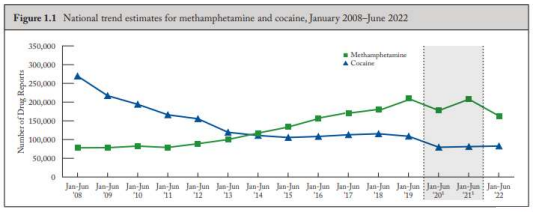
National Trends (Seizures)



[Source: National Forensic Laboratory Information System (NFLIS), U.S. Department of Justice Drug Enforcement Administration (2022)]

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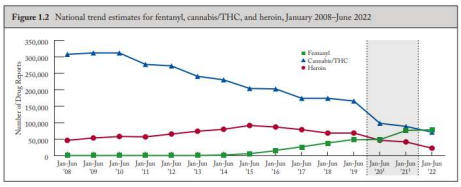
National Trends (Seizures)



Note: Estimates are shown for the first half of each year from January to June 2008 through January to June 2022.

[1]There was a noticeable decrease in the number of drugs reported and drug cases submitted and analyzed during 2020 and 2021 compared with earlier years, which is likely due, in part, to the impacts of COVID-19. Use caution when comparing the shaded estimates with other years' estimates.

[Source: National Forensic Laboratory Information System (NFLIS), U.S. Department of Justice Drug Enforcement Administration (2022)]

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"Novel Drugs"

- Designer Drugs
- Research Chemicals
- Legal Highs
- Psychoactive Substance

(Source: G. Sam Wang, MD)

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Synthetic Cannabinoids

- K2, Spice, Buddha
- Sold as incense, not for human consumption, aromatherapy
- JWH-018, etc.
- Over 150 known/detected

(Source: G. Sam Wang, MD)

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Resource for Trends

(Source: G. Sam Wang, MD)

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Overview: Opioid Crisis

- In 2019, nearly 50,000 deaths in the US from opioid-involved overdoses
- In 2021, approximately 80,411 deaths in the US from opioid-involved overdoses
- Over one death every 7 minute

(Source: CDC)

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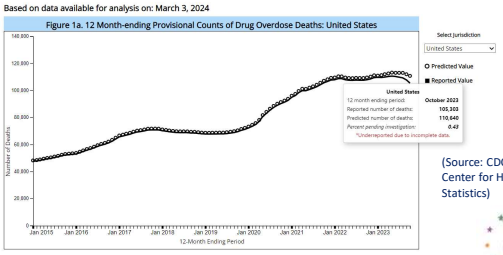
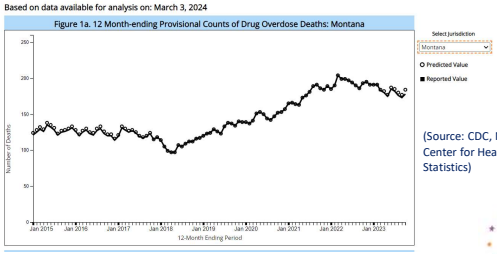
12 Month-Ending Provisional Number and Percent Change of Drug Overdose Deaths (US)



(Source: CDC, National Center for Health Statistics)

21

12 Month-Ending Provisional Number and Percent Change of Drug Overdose Deaths (MT)



(Source: CDC, National Center for Health Statistics)

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Prescription Painkillers

- Over-prescription of powerful opioid pain relievers beginning in the 1990s led to a rapid escalation of use and misuse by a broad demographic of men and women across the country

  Source: U.S. Department of Health and Human Services (HHS), Office of the Surgeon General. 2016. Facing addiction in America: The Surgeon General's report on alcohol, drugs, and health. Washington, DC

- About 1/3 of women of reproductive age filled an opioid prescription in 2016

(Source: Home Visiting Improvement Action Center Team. 2016. The emerging crisis of opioid addiction: Implications for home visiting.)

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Abuse of Prescription Drugs

- Roughly 21-29% of patients prescribed opioids for chronic pain misuse them
- Between 8-12% of people using an opioid for chronic pain develop an opioid use disorder
- An estimated 4-6% of people who misuse prescription opioids transition to heroin

(Source: CDC)

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Opioid Addiction

- Opioids are highly addictive
- Bind to receptors in the brain and create a pleasurable sensation that can lead to complex brain disease

  Source: American College of Obstetricians and Gynecologists Committee on Health Care for Underserved Women & the American Society of Addiction Medicine. 2017, August. ACOG Committee Opinion No. 711: Opioid use and opioid use disorder in pregnancy
- Individuals with Opioid Use Disorder (OUD) are characterized by having a mild, moderate or severe dependence on a certain illicit opioid drug and/or prescription medication
  - Occurs when the ongoing use of the drug causes a clinical inability to fulfill and experience normal activities and responsibilities

Source: SAMHSA, 2016. *Clinical guidance for treating pregnant and parenting women with opioid use disorder and their infants.*

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Prescription Opioid Addiction

- Withdrawal symptoms are similar to flu like symptoms: body aches, shaking, chills, nausea, vomiting, dry skin, exhaustion
- "Paraphernalia" – tea strainers in room with powder residue – used to crush and rinse coating off pain killers


Source: Lynn Reimer, PhD

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Prescription Painkillers

- Abuse of prescription painkillers associated with increase in heroin use
- Heroin very cheap and easy to get
- Don't start by shooting heroin, usually snort, pop in capsule, smoke



(Source: Lynn Reimer, PhD)

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Heroin and…

- Heroin on the street is dirty
  - Heroin is being mixed with fentanyl
  - Phillip Seymour Hoffman died of Heroin, Xanax, Cocaine & Methamphetamine
  - Over 80 deaths across US in one month after Hoffman death

- Speed Balls - one takes you up, one takes you down
  - Cocaine + heroin
  - Methamphetamine + heroin –"goof ball"
  - Often result in overdose & death

(Source: Lynn Reimer, PhD)

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Abuse of Fentanyl in US

- Synthetic opioid 100 times more potent than morphine, 50 times more potent than heroin
- Just 2 mg can be lethal
- Can be combined with other illicit drugs and sold as powders, sprays, or pressed pills
- Over 150 people die daily from overdoses of synthetic opioids like fentanyl

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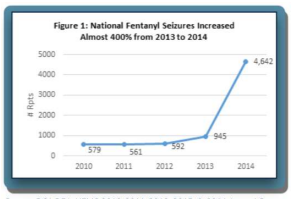
Fentanyl Law Enforcement Seizures

According to the DEA's National Forensic Laboratory Information System (NFLIS), the estimated number of items positive for fentanyl seized by law enforcement nationwide increased by almost 400% from 2013 (945) to 2014 (4,643)



Source: DOJ, DEA. NFLIS 2010, 2011, 2012, 2013, & 2014 Annual Report.

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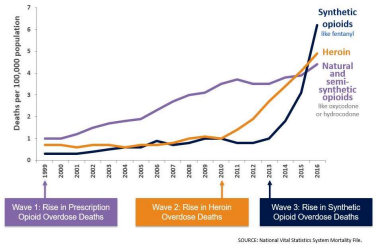
3 Waves of the Rise in Opioid Overdose Deaths



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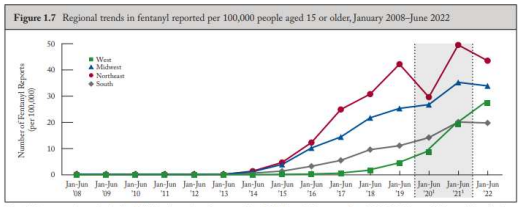
Regional Drug Trends – Fentanyl Seizures



[Source: National Forensic Laboratory Information System (NFLIS), U.S. Department of Justice Drug Enforcement Administration (2022)]

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Overdose and Naloxone

- Narcan® (Naloxone)
  - Opioid antagonist – FDA-approved
  - Temporarily reverses the effects of overdose
  - Causes rapid withdrawal symptoms
  - Available free to everyone
- Free OpiRescue app – helps recognize the signs of an overdose, find naloxone and use it to reverse, etc.
- May be used by lay people ("at home" use) or by emergency health care providers
- Fentanyl test strips – used to identify presence of fentanyl in unregulated drugs – negative result does not necessarily mean a drug is safe

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Marijuana Overview

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Marijuana - Basics

- Names: *pot, grass, reefer, weed, herb, Mary Jane, or MJ*
- Greenish-gray mixture of the dried, shredded leaves, stems, seeds, and flowers of *Cannabis sativa*
- Contains over 600 chemicals, about 70 of which are cannabinoids
  - THC: Psychoactive, mind-altering effect
  - CBD: Therapeutic, sedative effect

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Marijuana - Methods of Use

Inhalation	Ingestion	Topical
Smoked	Food	Lotions
Vaporized	Drink	Oils

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Marijuana - Things to Know

- Topicals are NON-psychoactive
- Raw plant is NON-psychoactive
- **Must heat plant material to temperature that releases active ingredients in THC**
- Eating cannabis is not the same as smoking it

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Diversity of E-Cigarette Products

(Source: Photo by Mandie Milles, CDC)

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Marijuana is not "just a plant" anymore – derivatives contain up to 98% THC

SAM Smart Approaches to Marijuana

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TABLE 1 Definitions of Dabbing Terminology Used by Users and Patients

References to the substance	
BHO	A THC concentrate created through use of solvents via either open column extraction or a closed-loop system. Products have a much higher THC concentration than traditional flower cannabis. They typically are consumed by placing the product on a heated surface and inhaling the vapors.
Shatter	A form of BHO with a solid, glasslike appearance. It shatters when scraped from the dish. Users consider this a superior form.
Budder	An extract that has a viscous, spreadable texture (this is distinct from cannabis-infused butter, which is ingested rather than inhaled).
Earwax or wax	An extract with a sticky, pasty consistency.
Honeycomb or crumble wax	A crumbly extract with a spongiform appearance and dry texture.
Dabbing	The act of inhaling the vapors from a concentrate.
Dab or glob	The amount of extract used for 1 inhalation (hit). Whereas dabs are standard sized dosages, globs represent unusually large amounts.
Honeybuds	Cannabis buds that have been infused with BHO.

(Source: Assessing the Dangers of "Dabbing": Mere Marijuana or Harmful New Trend?, John M. Stogner and Bryan Lee Miller, *Pediatrics* 2015;136,1)

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References to paraphernalia	
Oil rig or rig	A water pipe or bong designed specifically to use concentrates, with the bowl replaced by a nail and dome (or by a swing or skillet).
Nail	A hollow rod used in place of a bowl to use concentrates, usually made of titanium (glass and quartz are also used).
Swing or skillet	A small metallic plate or pan clipped with wires to an oil rig and used to smoke concentrates. The plate is heated and then swung to the pipe opening before a concentrate is applied. A swing would be used in lieu of a nail.
Wand, dabber, or pick	A device used to apply concentrates to a heated surface.
Dome or globe	A concave glass cap placed over a hot nail to contain vapors.
Torch	A small blowtorch used to heat a nail or skillet for using concentrates (usually a handheld crème brûlée torch or propane canister).
E-pen	Handheld electric smoking device used for vaporizing extracts.
References to manufacturing	
Open column extraction	Extraction method in which a solvent, such as butane, is passed through a stainless steel or glass cylinder packed with cannabis material, through a screen, and onto a Pyrex dish or tray. The resulting product is then purged of solvent.
Blasting	Slang term for open column butane extraction; often refers to amateur production.
Closed loop system	Extraction method and equipment that recaptures the solvent gas released for reuse, typically associated with commercial or medical production.
Dual extraction method	The pairing of a butane extraction with an alcohol wash. Butane is used as a solvent in the "first run." Alcohol is used for the "second run."
Purging	The act of drawing out any solvents from concentrate (eg, whipping with low heat, vacuum leaching).

Some colloquial definitions are adapted from Black.[7]

(Source: Assessing the Dangers of "Dabbing": Mere Marijuana or Harmful New Trend?, John M. Stogner and Bryan Lee Miller, *Pediatrics* 2015;136,1)

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Marijuana Edibles

Edibles
Serving Size = 10mg
Retail Limit = up to 100 mg
Medical Limit = N/A
Onset = 30 min to 4 hour

Smoking
5mg= 2 hits on a joint
35mg= an entire joint
130mg= an eighth ounce
Onset = Instant

Products
Baked Goods – Brownies, Cookies, Cakes, Pies, Granola Bars, Pastries, Nut Clusters
Bulk Foods – Cereal, Granola, Trail Mix, Nuts, Popcorn, Crackers, Baking Mixes
Chocolate – Bars, Truffles, Candy Coatings
Liquid – Cooking Oil, Coffee, Juice, Tea, Soft Drinks, Sauces (Marinara, Wing, Tapenade)
Pills – Capsules, Pressed Pills
Hard Candy – Suckers, Lozenges
Soft Candy – Gummies, Chocolate Chews, Fruit Chews, Licorice, Taffy

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Marijuana - The Industry Today

(Source: Marijuana Business Journal; other media. Icons: Marianna Nardella; Anton Gajosik; Petra Prgomet; Joey Golaw; Creative Stall; Luis Prado; Aha-Soft)

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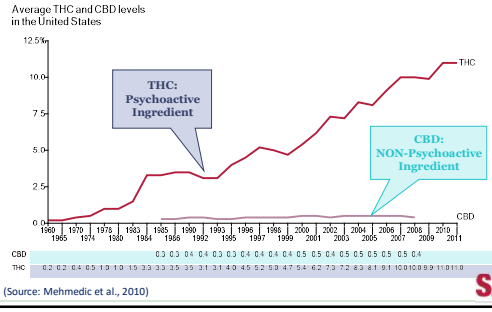
Marijuana has become significantly more concentrated since the 1960s



(Source: Mehmedic et al., 2010)

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Marijuana - Concentration

- Hundreds of hybrid strains of varying strengths
  - THC Levels 1983: 4% average
  - THC Levels Today: 9-12% average
    - As high as 29% advertised
    - 121% increase from 1999 to 2010
- THC content/potency has been steadily increasing over the past 30+ years
- Concerns that consequences could be worse than in the past, especially among new users or in young people with developing brains
- Do not know all consequences to the brain and body

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Marijuana Effects on the Brain

- THC binds to specific sites in the brain called cannabinoid receptors (CBRs)
- CBRs are located on the surface of nerve cells
- CBRs are found in high-density areas of the brain that influence pleasure, memory, thinking, concentration, movement, coordination, and sensory and time perception
- Part of a vast communication network called the endocannabinoid system - plays a critical role in normal brain development and function
- TCH effects are similar to those produced by naturally occurring chemicals found in the brain and body called *endogenous cannabinoids* – help control many of the same mental and physical functions disrupted by MJ use
- Over time, overstimulation can alter CBR function and lead to addiction and withdrawal symptoms when use stopped

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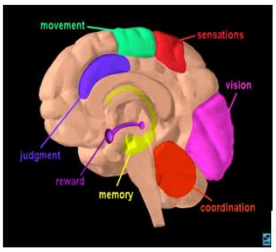
Cannabinoid Receptors Are Located Throughout the Brain and Regulate a Host of Brain Activity

- Brain Development
- Memory & Cognition
- Motivational Systems & Reward
- Appetite
- Immunological Function
- Reproduction
- Movement Coordination
- Pain Regulation & Analgesia



(Source: NIDA)

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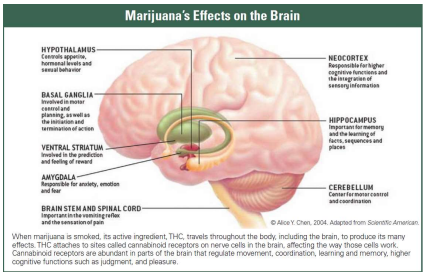
Marijuana Affects the Brain



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Marijuana Use - Short Term Effects

- Impairs short-term memory
- Impairs attention, judgment, and other cognitive functions
- Impairs coordination and balance
- Increases heart rate
- Altered perception of time
- Occasionally - anxiety, fear, distrust, or panic
- High Doses - acute psychosis, which includes hallucinations, delusions, and a loss of the sense of personal identity

Source: Volkow N, et al. Adverse Health Effects of Marijuana Use. N Engl J Med 2014;370:2219-27.

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Marijuana - Addiction and Withdrawal

- Addiction
  - Approximately 9% of those who use marijuana will become addicted (according to criteria for dependence in the DSM-IV)
  - 1 in 6 among those who start marijuana use as teenagers
  - Up to 25-50% among those who use marijuana daily
  - 2.7 million people 12 years of age and older met DSM-IV criteria for dependence on marijuana (5.1 million people met criteria for dependence on any illicit drug, 8.6 million met criteria for dependence on alcohol)
- Withdrawal
  - Irritability, Sleeping difficulties, Dysphoria, Craving, Anxiety

(Source: Lopez-Quintero C, et al. Results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Drug Alcohol Depend 2011;115:120-30.)

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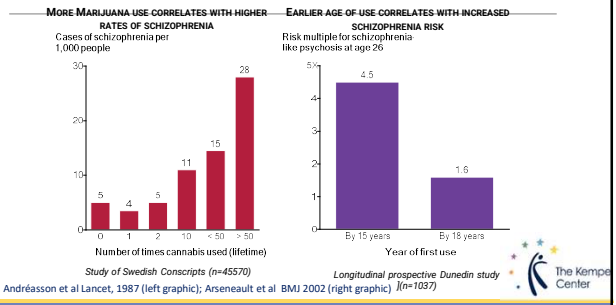
Marijuana Use is Strongly Correlated with Psychosis



[Source: Andréasson et al Lancet, 1987 (left graphic); Arseneault et al BMJ 2002 (right graphic)]

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Causal Relationship between Marijuana and Mental Illness

Case Reports in Medicine
Volume 2009, Article ID 321456, 2 pages
http://dx.doi.org/10.1155/2009/321456

Case Report

Suicidal Ideation Induced by Episodic Cannabis Use

Michele Raja[1,2] and Antonella Azzoni[2]

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[2]Servizio Psichiatrico di Diagnosi e Cura, Ospedale Santo Spirito, Via Prisciano 26, 00136 Rome, Italy

3. Discussion

In patient's life, suicidal ideation presented in two different occasions, only immediately after acute cannabis intoxication. This strongly suggests the causal relationship between intoxication and suicidal ideation.

There is a convincing relationship between suicidal behavior and cannabis use, the latter awakening depressive experiences [3]. Rates of cannabis abuse are elevated among those being treated for depression [4, 5] and among those making a suicidal attempt [6]. In a sample of Italian students, the use of cannabis was associated with suicide risk [7]. In a population of French adolescents, cannabis use appeared to be an independent predictor of suicidal ideation after controlling the depressive symptoms [8]. In a cohort study of young Norwegians, cannabis by itself seemed not to lead to depression but was associated with later suicidal thoughts and attempts [9].

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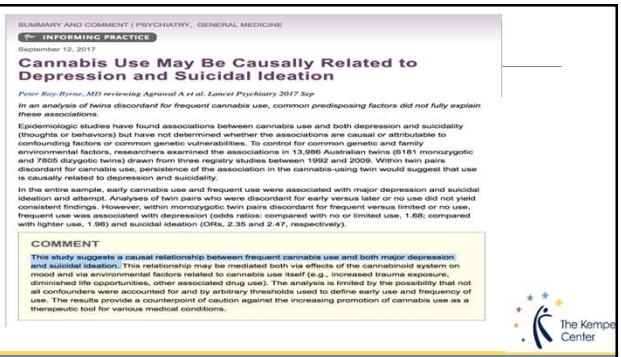

SUMMARY AND COMMENT | PSYCHIATRY, GENERAL MEDICINE

INFORMING PRACTICE

September 12, 2017

Cannabis Use May Be Causally Related to Depression and Suicidal Ideation

Peter Rey-Byrne, MD reviewing Agrawal A et al. Lancet Psychiatry 2017 Sep

In an analysis of twins discordant for frequent cannabis use, common predisposing factors did not fully explain these associations.

Epidemiologic studies have found associations between cannabis use and both depression and suicidality (thoughts or behaviors) but have not determined whether the associations are causal or attributable to confounding factors or common genetic vulnerabilities. To control for common genetic and family environmental factors, researchers examined the associations in 13,986 Australian twins (6181 monozygotic and 7805 dizygotic twins) drawn from three registry studies between 1992 and 2009. Within twin pairs discordant for cannabis use, persistence of the association in the cannabis-using twin would suggest that use is causally related to depression and suicidality.

In the entire sample, early cannabis use and frequent use were associated with major depression and suicidal ideation and attempt. Analyses of twin pairs who were discordant for early versus later or no use did not yield consistent findings. However, within monozygotic twin pairs discordant for frequent versus limited or no use, frequent use was associated with depression (odds ratios: compared with no or limited use, 1.68; compared with lighter use, 1.98) and suicidal ideation (ORs, 2.35 and 2.47, respectively).

COMMENT

This study suggests a causal relationship between frequent cannabis use and both major depression and suicidal ideation. This relationship may be mediated both via effects of the cannabinoid system on mood and via environmental factors related to cannabis use itself (e.g., increased trauma exposure, diminished life opportunities, other associated drug use). The analysis is limited by the possibility that not all confounders were accounted for and by arbitrary thresholds used to define early use and frequency of use. The results provide a counterpoint of caution against the increasing promotion of cannabis use as a therapeutic tool for various medical conditions.

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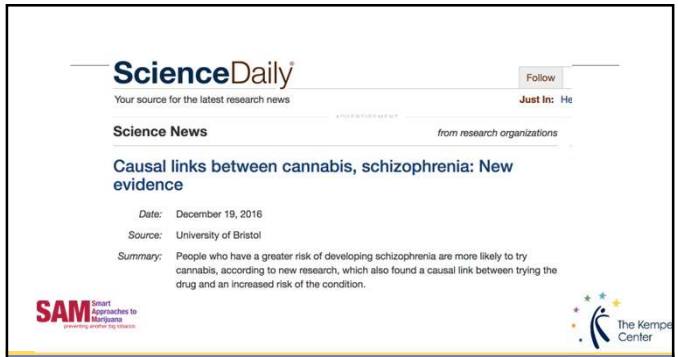

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Causal links between cannabis, schizophrenia: New evidence

Date: December 19, 2016

Source: University of Bristol

Summary: People who have a greater risk of developing schizophrenia are more likely to try cannabis, according to new research, which also found a causal link between trying the drug and an increased risk of the condition.

SAM Smart Approaches to Marijuana

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These can often present as a "psychotic episode" – which is a relatively sudden worsening of psychotic symptoms over a short time-frame, frequently resulting in hospitalisation.

The heaviest users of cannabis are around four times as likely to develop schizophrenia (a psychotic disorder that affects a person's ability to think, feel and behave clearly) than non-users. Even the "average cannabis user" (for which the definition varies from study to study) is around twice as likely as a non-user to develop a psychotic disorder.

Furthermore, these studies found a causal link between tetrahydrocannabinol (THC - the plant chemical which elicits the "stoned" experience) and psychosis. This means the link is not coincidental, and one has actually caused the other.

SAM Smart Approaches to Marijuana

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Buying & Selling Marijuana

- Be aware of state/local laws
  - (Ex.) Only legal to purchase from regulated medical dispensary or retail marijuana facility
  - May give less than an ounce over 21 without remuneration
- Inherent dangers with home distribution
  - Potential for violence
  - Potential for burglary
  - Organized crime
  - Unpredictable environment
  - Unknown adults

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Marijuana Cultivation Concerns

Presence of:

- Growing rooms
- Processing rooms
- Hash oil labs

Hazards:

- Electrical
- Chemical
- Air quality
- THC
- Mold & fungus

(Source: Detective Darren Bloom, Longmont Police Department, 2011)

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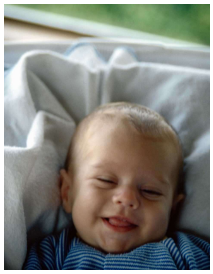
Substance Use and Infants/Children/Youth



- Youth Use
- Prenatal exposure and breastfeeding
- Caregiver impairment
- Environmental exposure
- Manufacturing and grows: Toxin/chemicals/molds exposure risk

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Perspectives…

- View from multiple systems
- There are many nuances
  - Evolving mindset results in evolving policy
  - Need to disentangle social and societal beliefs
  - May have a certain image in mind, but could be family/friend/community member
  - Complex issues with trauma embedded
- Healthcare approach

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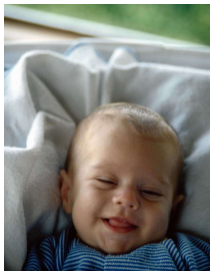
Substance Use and Infants/Children/Youth



- Youth Use
- Prenatal exposure and breastfeeding
- Caregiver impairment
- Environmental exposure
- Manufacturing and grows: Toxin/chemicals/molds exposure risk

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Infants Prenatally Substance Exposed (IPSE)
Defining the Problem

- Limitations in data exist on the extent of the problem and successful approaches to address it
- Fear of criminal prosecution and child welfare involvement reduces utilization of medical and treatment resources
- Need early identification to reduce risks to the infant and enhance success

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Under-Estimation of Cases Infants with Prenatal Substance Exposure (IPSE)

- Social stigma for mothers and families
- Fear
- Unreliability of mothers' self-reports
- Lack of uniformity in hospital policies and procedures for screening, testing, referrals
- Limitations of toxicology testing techniques

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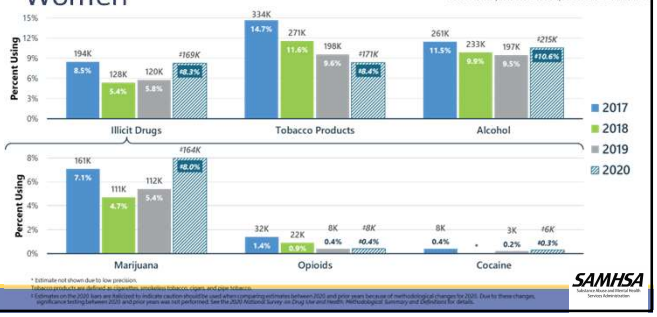
Past Month Substance Use Among Pregnant Women



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Effects Vary Widely

- Effects are variable -- on mother, baby or both
- **Alcohol is most dangerous to fetal brain & body**
- Illegal drugs – data are often confounded by poly-substance use, poverty, violence, genetics, etc.
- Poor prenatal care
- Poor nutrition/poor weight gain
- Good home environment helps

No Safe Amount of Drugs or Alcohol During Pregnancy

(Source: *Peds* 129:e540/2/2012)

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General Problems for Mother

- Infections such as HIV, tuberculosis, hepatitis, syphilis, endocarditis, pulmonary infections
- Mental health problems including depression, anxiety, mood disorders, bipolar disorder, personality disorders, post-traumatic stress disorder, and eating disorders
- History of victimization related to physical and sexual violence
- Poor nutrition
- Health complications
- Complications of Pregnancy, Labor and Delivery

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General Problems for Baby

Effects on baby differ with different exposure patterns:

- When in pregnancy
  - Major birth defects occur in first 3 months
  - Brain damage & poor growth occur throughout
- How much
- How often
- How taken

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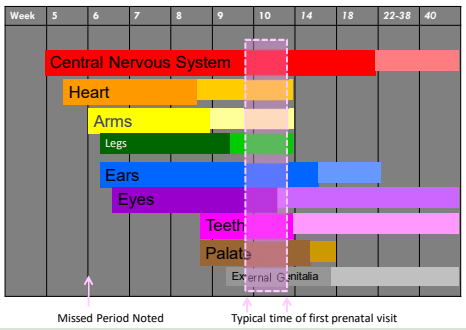
Timeline of Fetal Development



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General Problems for Baby (cont.)

- Small babies
- Prematurity
- High bilirubin/jaundice
- Low blood sugar
- Drug Withdrawal Syndrome
  - Physical Dependence
- Meconium aspiration
- Other breathing problems
- Infections
- Increased risk of death

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TABLE 17.1
Possible Clinical Presentations Related to Prenatal Substance Exposure

	Alcohol	Nicotine/Tobacco	Marijuana/THC	Opiates	Cocaine	Methamphetamine
Effect on fetal growth	• Effect on growth thinnest be present to diagnose FASD. • Associated with even moderate levels of exposure.	• Low birth weight and IUGR • Directly proportional to number of cigarettes smoked • Appears to resolve by 24 mo of age	• Studies limited • May be associated with low birth weight/small for gestational age	• Reported but many confounding variables • Low birth weight, due to symmetric IUGR or preterm birth • Microcephaly	• Effect on intrauterine growth demonstrated/small for gestational age • Decreased head circumference	• Studies limited • Independent effect on fetal growth demonstrated
Congenital anomalies	• Multiple anomalies describe throughout the literature • FASD	Weak data for association with oral facial clefts	No clear teratogenic effect	No clear teratogenic effect	Original reports not confirmed	Studies limited
Withdrawal	One study reporting withdrawal symptoms, but not confirmed in longitudinal studies	• No clear withdrawal described • Abnormal newborn behavior consistent with drug toxicity	• No clear withdrawal • Abnormal newborn behavior	NAS	Early reports but not substantiated	No prospective studies available
Neurobehavior in newborn	• Poor habituation and low levels of arousal • Motor abnormalities	Impaired orientation and autonomic regulation and abnormalities of muscle tone	Increased startle and tremors	• Abnormal neurobehavior related to NAS/withdrawal • Subacute/delayed withdrawal	• Irritability and lability of state • Decreased behavioral and autonomic regulation • Poor alertness and orientation	• Abnormal neurobehavioral patterns including poor movement quality, decreased arousal, and increased stress

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TABLE 17.1
Possible Clinical Presentations Related to Prenatal Substance Exposure (*Continued*)

	Alcohol	Nicotine/Tobacco	Marijuana/THC	Opiates	Cocaine	Methamphetamine
Long-term effects	• Significant attention problems from childhood through adulthood • Lower IQ scores • Poor memory and executive functioning skills • Impaired development and use of language • Variety of significant academic and school problems, primarily deficits in reading and math skills	• Impulsivity and attention problems • Associated with hyperactivity and reactive and externalizing behaviors through childhood and into adulthood • Possible abnormalities in learning and memory • Slightly lower IQ scores • Poor language development • Poorer performance on arithmetic and spelling tasks • Increased probability of tobacco use • Experimentation with drugs among adolescents	• Inattention and impulsivity in toddlers • Memory and perceptual problems in older children • Associated with deficits in problem-solving skills that require sustained attention and visual memory, analysis, and integration • Subtle deficits in learning and memory • Associated with academic underachievement, especially in reading and spelling • Associated with behavioral problems	• Hyperactivity and short attention span • Improved developmental scores with age appropriate medical and environmental controls	• Some aspects of problems, possibly moderated by other risks, such as attention difficulties and oppositional/deficient behavior • Does not predict overall development or IQ scores • Alterations in executive functioning including visual-motor ability, attention, and working memory • Association with subtle language delays	• Possible association with externalizing behaviors and poor problems • Possible association with lower IQ scores

Abbreviations: FASD, fetal alcohol spectrum disorder; IUGR, intrauterine growth retardation; NAS, neonatal abstinence syndrome; THC, tetrahydrocannabinol.

Source: Farst J and Wells KM. Drug Endangered Children. In Child Abuse: Medical Diagnosis and Management. 4th ed. Illinois: American Academy of Pediatrics (2019), eds. Antoinette Laskey and Andrew Sirotnak: 527-563

70

All Exposures = Increased Infant Mortality

- Associated increased risk of SIDS/SUIDS (?)
- Associated risk of positional overlay
- Associated risk of very premature birth and severe complications

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Neonatal Opioid Withdrawal Syndrome (NOWS)

7 newborns were diagnosed with neonatal opioid withdrawal syndrome (NOWS) for every 1,000 newborn hospital stays
- Approximately 1 baby every 19 minutes in the United States
- Nearly 80 newborns diagnosed every day

The number of babies born with NOWS increased by 82% nationally from 2010 to 2017 - increases were seen for nearly all states and demographic groups

(**Sources:** HCUP Fast Stats. Healthcare Cost and Utilization Project (HCUP). September 2021. Agency for Healthcare Research and Quality, Rockville, MD; Hirai AH, Ko JY, Owens PL, Stocks C, Patrick SW. Neonatal Abstinence Syndrome and Maternal Opioid-Related Diagnoses in the US, 2010-2017. JAMA. 2021;325(2):146–155. doi:10.1001/jama.2020.24991)

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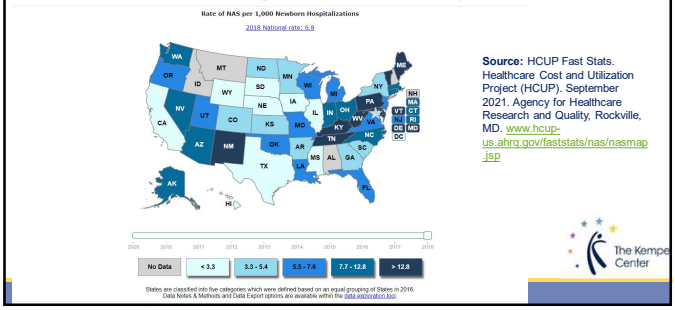
Neonatal Opioid Withdrawal Syndrome (NOWS) Among Newborn Hospitalizations



Source: HCUP Fast Stats. Healthcare Cost and Utilization Project (HCUP). September 2021. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/faststats/nas/nasmap.jsp

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Opiate Use in Pregnancy
Neonatal Opioid Withdrawal Syndrome Treatment

- Historically used modified Finnegan's Neonatal Abstinence Scoring System to monitor – new data on FNASS (Yale New Haven studies)
- Nonpharmacologic support
  - Breastfeeding
  - Skin-to-skin contact
  - Minimizing environmental stimuli
  - Swaddling, swaying, or rocking
  - Promoting adequate rest and sleep
  - Rooming-in
  - Providing sufficient caloric intake to establish weight gain
- Eat, Sleep, Console – a comprehensive care strategy for infants with NOW that incorporated a standardized stepwise non pharmacologic and pharmacologic approach to NOWS treatment

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Opioid Use and Breastfeeding

- Important intervention
  - If on opioid maintenance
  - Should be encouraged (unless HIV positive, using illicit drugs or have a disease or infection for which breastfeeding is not advised)
  - Less likely to need pharmacologic treatment for NAS
  - Can reduce length of hospital stay
- Only available intervention demonstrated to reduce NAS severity in opioid-exposed newborns

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Marijuana Prevalence Estimates

- Most commonly used illicit drug during pregnancy, and RISING
- 2.4% in 2002 (ages 18-44); almost 4% in 2014
- Study*:
  - From 2009 to 2016, marijuana use based on self-report or urine toxicology among 279,457 pregnant women increased from 4% to 7%
  - Women were almost twice as likely to screen positive for marijuana use via urine drug tests versus self-report (strongly suggesting that marijuana use during pregnancy has been underestimated in self-reported surveys)
  - 22% of adolescents (aged <18) and 19% of young adults (aged 18-24) screened positive for marijuana use in 2016
- 4-5% of women use marijuana during pregnancy (estimates range from 2.5 to 27%)
- 60% of cannabis users continued to use ~10 joints per week throughout pregnancy (60-70% of the level of use the year before)
- Many women reporting cannabis use for nausea and vomiting during pregnanc

(*Source: Young-Wolff, K.C., et al. Trends in Self-reported and Biochemically Tested Marijuana Use Among Pregnant Females in California From 2009-2016. *The Journal of the American Medical Association*.)

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Marijuana Dispensaries

- 70% of marijuana dispensaries in Colorado recommended THC products to pregnant women
- Medical dispensaries were more likely to recommend marijuana products than retail dispensaries: 83% and 60% respectively

SAM Smart Approaches to Marijuana
preventing another big tobacco

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Marijuana Use in Pregnancy

- Animal research suggests that the body's endocannabinoid system plays a role in control of brain maturation, particularly in the development of emotional responses
- Endocannabinoid receptors are thought to exhibit a cellular distribution map different from adults
- Double-hit hypothesis
- Epigenetic processes and behavioral consequences
- Concern that even low concentrations of THC during prenatal period may have profound and long-lasting consequences for the brain and behavior

(Source: Alpar A, DiMarzo V, Harkany T. Biol Psych 2015)

78

MJ Prenatal Effects on Infants/Children

- Highest level of evidence available longitudinal cohort studies - OPPS Study, MHPCD Study, Generation R Study
- Conflicting results on:
  - Differences in birth weight and birth length from marijuana
  - Neonatal development
- Infant behavior – lower memory functioning and verbal scores
- Child behavior – **consistent significant impact as a result of prenatal exposure** – more impulsivity and hyperactivity, inattention, detrimental affect of intellectual development, delinquency, problems in abstract and visual reasoning, depressive symptoms
  - Most common among heavy cannabis users ~ 1 or more joints per day

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CDPHE Statements

- There is no known safe amount of marijuana during pregnancy
- THC can pass from mother to the unborn child through the placenta
- The unborn child is exposed to THC used by the mother
- Maternal use of marijuana during pregnancy is associated with negative effects on exposed children that may not appear until adolescence
  - The most negatively affected are academic ability, cognitive function and attention, which may not become evident until adolescence when these typically develop
- There are negative effects of marijuana use during pregnancy regardless of when it is used during pregnancy

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Marijuana Use While Breastfeeding

- Clinical data suggests marijuana use during breastfeeding may be dangerous for the infant
  - THC is excreted in breast milk
  - Decrease in Infant Motor & Psychomotor Development
- Impact varies based on regular vs. occasional use
- Infants should be closely monitored
- **CDPHE Statement:** THC can also be passed from the mother's breast milk, potentially affecting the baby.
- **AAP Statement:** Breastfeeding is contraindicated for women using marijuana

(Source: Aurelia, G, et al, Journal of Toxicology, 2009)

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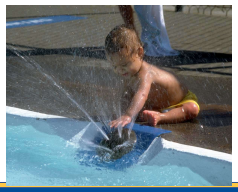
General Effects on the Growing Child

- Studies limited and inconsistent
- More likely to show gaps in problem-solving skills, memory, and ability to remain attentive
- More research needed to separate drug-effect from environmental effects



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General Effects in Children and Teens

- Difficulties with attention, self-regulation, decision-making and cognition
- Risk of maltreatment and impaired attachment may result in Child Welfare involvement
- School problems and employment failure
- Behavioral, mental health, substance abuse problems
- Significant societal and financial costs
- Early diagnosis is protective

(Source: Streissguth. *J Dev Behav Pediatrics* 2004 25:228)

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FEBRUARY 3, 1997 VOL. 149 NO. 5

SPECIAL REPORT

FERTILE MINDS

FROM BIRTH, A BABY'S BRAIN CELLS PROLIFERATE WILDLY, MAKING CONNECTIONS THAT MAY SHAPE A LIFETIME OF EXPERIENCE. THE FIRST THREE YEARS ARE CRITICAL

BY J. MADELEINE NASH

"Symbiotic Oneness"

84

CAPTA: Legislative History

- Originally enacted in 1974
- Reauthorized a number of times, most recently in 2010
- Due again for reauthorization

More about CAPTA's legislative history here: https://www.childwelfare.gov/pubPDFs/about.pdf

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Plans of Safe Care Requirement (2003)

SEC. 114. GRANTS TO STATES FOR CHILD ABUSE AND NEGLECT PREVENTION AND TREATMENT PROGRAMS

(I) IN GENERAL.—Section 106(b) of the Child Abuse Prevention and Treatment Act (42 U.S.C. 5106a(b)) is amended— (A) in paragraph (1)(B)—

(ii) policies and procedures (including appropriate referrals to child protection service systems and for other appropriate services) to address the needs of infants born and identified as being affected by illegal substance abuse or withdrawal symptoms resulting from prenatal drug exposure, including a requirement that health care providers involved in the delivery or care of such infants notify the child protective services system of the occurrence of such condition in such infants, except that such notification shall not be construed to—

"(I) establish a definition under Federal law of what constitutes child abuse; or "(II) require prosecution for any illegal action;
"(iii) the development of a plan of safe care for the infant born and identified as being affected by illegal substance abuse or withdrawal symptoms;"
(iii) in clause (iv) (as so redesignated), by inserting "risk and" before "safety"(iv) "(v) triage procedures for the appropriate referral of a child not at risk of imminent harm to a community organization or voluntary preventive service;"
"(ix) provisions to require a State to disclose confidential information to any Federal, State, or local government entity, or any agent of such entity, that has a need for such information in order to carry out its responsibilities under law to protect children from abuse and neglect;"

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Plans of Safe Care Requirement (2016)

SEC. 503. INFANT PLAN OF SAFE CARE.
(a) Best Practices for Development of Plans of Safe Care.--Section 103(b) of the Child Abuse Prevention and Treatment Act (42 U.S.C. 5104(b)) is amended-
``(5) maintain and disseminate information about the requirements of section 106(b)(2)(B)(iii) and best practice relating to the development of plans of safe care as described in such section for infants born and identified as being **affected by substance abuse or withdrawal symptoms, or a Fetal Alcohol Spectrum Disorder;".**
(b) State Plans.--Section 106(b)(2)(B) of the Child Abuse Prevention and Treatment Act (42 U.S.C. 5106a(b)(2)(B)) is amended--
(1) in clause (ii), by striking ``illegal substance abuse"and inserting ``substance abuse"; and
(2) in clause (iii)- (A) by striking ``illegal substance abuse" and inserting ``substance abuse"; and
(B) ``to ensure the safety and well-being of such infant following release from the care of health care providers, including through--
``(I) addressing the health and substance use disorder treatment needs of the infant and affected family or caregiver; and
``(II) the development and implementation by the State of monitoring systems regarding the implementation of such plans to Determine whether and in what manner local entities are providing, in accordance with State requirements, referrals to and delivery of appropriate services for the infant and affected family or caregiver".
(c) Data Reports.--
(1) In general.--Section 106(d) of the Child Abuse Prevention and Treatment Act (42 U.S.C. 5106a(d)) is amended by adding at the end of the following:
``(17) The number of infants--
``(A) identified under subsection (b)(2)(B)(ii);
``(B) for whom a plan of safe care was developed under subsection (b)(2)(B)(iii); and
``(C) **for whom a referral was made for appropriate services, including services for the affected family or caregiver**

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Plans of Safe Care Requirement

2003 CAPTA Reauthorization: Establishes state responsibilities regarding prenatally exposed infants in order to receive federal CAPTA funding.

Comprehensive Addiction and Recovery Act of 2016: Modified the CAPTA State plan requirement for infants born and identified as being affected by substance use or withdrawal symptoms or fetal alcohol spectrum disorders by adding criteria to State plans to ensure the safety and well-being of infants following their release from the care of health-care providers, to address the health and substance use disorder treatment needs of the infant and affected family or caregiver, and to develop the plans of safe care for infants affected by all substance use (not just the use of illegal substances, as was the requirement prior to this change).

Substance Use-Disorder Prevention That Promotes Opioid Recovery and Treatment for Patients and Communities Act of 2018: Authorized grants to States for the purpose of assisting child welfare agencies, social services agencies, substance use disorder treatment agencies, hospitals with labor and delivery units, medical staff, public health and mental health agencies, and maternal and child health agencies to facilitate collaboration in developing, updating, implementing, and monitoring plans of safe care.

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Current Statute: §5106a. (b)(2)

A State plan submitted under paragraph (1) shall contain a description of the activities that the State will carry out using amounts received under the grant to achieve the objectives of this subchapter, including—

(B) an assurance in the form of a certification by the Governor of the State that the State has in effect and is enforcing a State law, or has in effect and is operating a statewide program, relating to child abuse and neglect that includes—

(ii) policies and procedures (including appropriate referrals to child protection service systems and for other appropriate services) to address the needs of infants born with and identified as being affected by substance abuse or withdrawal symptoms resulting from prenatal drug exposure, or a Fetal Alcohol Spectrum Disorder, including a requirement that health care providers involved in the delivery or care of such infants notify the child protective services system of the occurrence of such condition in such infants, except that such notification shall not be construed to—

(I) establish a definition under Federal law of what constitutes child abuse or neglect; or
(II) require prosecution for any illegal action;

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Current Statute: §5106a. (b)(2) Continued

(iii) the development of a plan of safe care for the infant born and identified as being affected by substance abuse or withdrawal symptoms, or a Fetal Alcohol Spectrum Disorder to ensure the safety and well-being of such infant following release from the care of health care providers, including through—

(I) addressing the health and substance use disorder treatment needs of the infant and affected family or caregiver; and
(II) the development and implementation by the State of monitoring systems regarding the implementation of such plans to determine whether and in what manner local entities are providing, in accordance with State requirements, referrals to and delivery of appropriate services for the infant and affected family or caregiver;

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Current Statute: §5106a.

(d) Annual State data reports

Each State to which a grant is made under this section shall annually work with the Secretary to provide, to the maximum extent practicable, a report that includes the following:

(18) The number of infants—

(A) identified under subsection (b)(2)(B)(ii);

(B) for whom a plan of safe care was developed under subsection (b)(2)(B)(iii); and

(C) for whom a referral was made for appropriate services, including services for the affected family or caregiver, under subsection (b)(2)(B)(iii).

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CAPTA Reauthorization

This bill revises and reauthorizes through FY2027 state and community-based child abuse and prevention grants programs, supports for adoption and foster care, and other programs addressing child abuse and neglect

The Senate version includes changes to **Plans of Safe Care** requirements.

Here is the current Senate version of the CAPTA reauthorization

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Summary of Proposed Changes related to Plans of Safe Care

If passed, the Senate version would:

- Create a new title in CAPTA (e.g. a new section or "chapter" of the law) that is exclusive about "PUBLIC HEALTH RESPONSE TO INFANTS AFFECTED BY SUBSTANCE USE DISORDER" (Title IV)
- Rename "plan of safe care" as a "***family care plan***"
- Update the previous "affected by" language to be "infants born with, and identified as being affected by, ***substance use disorder, including alcohol use disorder***;"
- Require policies and procedures that support the development of a family care plan ***prior to the expected delivery*** of the infant
- Require state policies and procedures for ***providers involved in the delivery/care of infants to notify the state***
- Require the development of a family care plan to include:
  - Family assessment approach
  - Coordinated service delivery of health and SUD needs of infant and affected caregiver
  - Development and implementation of state monitoring systems regarding the implementation of such plans to determine whether, and in what manner, local entities are providing referrals to and delivery of appropriate services for the infant and affected family member or caregiver
- ***Require the notification system to be a separate system from child abuse and neglect reporting***

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Proposed Grant Program: Allowable Uses of Grant Funding:

"(d) USES OF FUNDS.—Funds awarded to a State under this subsection may be used for the following activities, which may be carried out by the State directly, or through grants or subgrants, contracts, or cooperative agreements:

"(1) Improving State and local systems with respect to the development and implementation of family care plans, which—

"(A) shall address the health and substance use disorder treatment needs of the infant and affected family or caregiver and include parent and caregiver engagement, regarding available treatment and service options and include resources available for pregnant, perinatal, and postnatal women; and

"(B) may include activities such as—

"(i) developing policies, procedures, or protocols for the administration or development of evidence-based and validated screening tools for infants who may be affected by substance use disorder, including alcohol use disorder, and pregnant, perinatal, and postnatal women whose infants may be affected by substance use disorder, including alcohol use disorder;

"(ii) improving assessments used to determine the needs of the infant and family;

"(iii) improving ongoing case management services;

"(iv) improving access to treatment services, which may be prior to the pregnant woman's delivery date;

"(v) keeping families safely together when it is in the best interest of the child; and

"(vi) developing the notification pathway as an alternative to a child maltreatment report, as described in subsection 402(c)(2).

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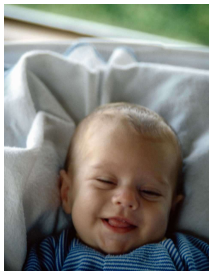
Substance Use and Infants/Children/Youth



- Youth Use
- Prenatal Exposure and Breastfeeding
- Caregiver impairment
- Environmental Exposure
- Manufacturing and Grows: Toxin/chemicals/molds exposure risk

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Children in Substance-Abusing Homes

- 8.3 million (12% of U.S. children) live with at least one parent who is alcoholic or in need of substance abuse treatment.

Source: National Survey on Drug Use and Health Report 4/16/2009

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Children of Parents with Substance Abuse Problems

- Have poorer developmental outcomes (physical, intellectual, social and emotional)
- 3X more likely to experience physical, verbal, or sexual abuse
- 4X more likely to be neglected
- 3 to 8X greater risk for substance abuse themselves

(Source: CASA Columbia, 2005)

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Substance Abuse Affects Connection

- Risk of impeding development of the parent-child relationships that are essential for children to thrive
- Mothers may have self regulatory challenges, leading to maladaptive maternal response that interfere with healthy relationships
- Mothers may experience negative outcomes such as struggles with depression and other psychiatric disorders

(Source: Kim, P., & Watamura, S. E. (2015). Two open windows: Infant and parent neurobiologic change. Washington, DC: Ascend, The Aspen Institute.)

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Substance Abuse Affects Parenting

- Impaired attachment
- Impaired judgment and priorities
- Inability to provide the consistent care, supervision, necessities, and guidance children need
- Substance abuse is a critical factor in ~7 out of 10 child welfare cases

Source: *Pediatrics* 2009, 124:285; CASA Columbia, April 1999

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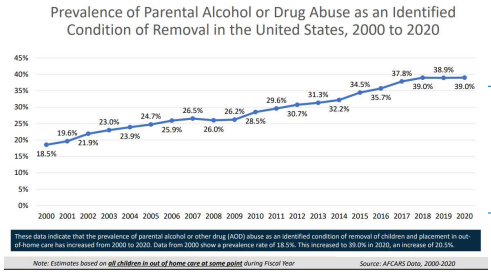
Prevalence of Parental Alcohol or Drug Abuse as an Identified Condition of Removal in the United States



Source: National Center on Substance Abuse and Child Welfare, https://ncsacw.samhsa.gov/research/child-welfare-and-treatment-statistics.aspx

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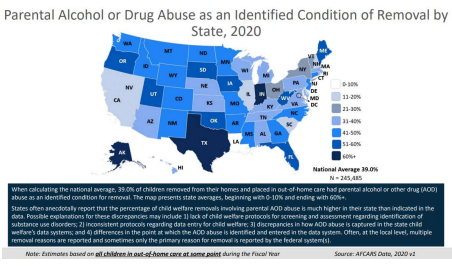
Parental Alcohol or Other Drug Abuse as an Identified Condition or Removal by State, 2020



Source: National Center on Substance Abuse and Child Welfare, https://ncsacw.samhsa.gov/research/child-welfare-and-treatment-statistics.aspx

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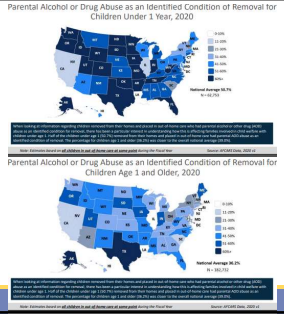
Percent of Children Removed with Parental Alcohol or Drug Abuse as an Identified Condition of Removal by Age, 2019



Source: National Center on Substance Abuse and Child Welfare, https://ncsacw.samhsa.gov/research/child-welfare-and-treatment-statistics.aspx

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Impact on Children

- Impaired Caregivers
  - Lack of Supervision
  - Lack of Necessities
  - Abuse or Neglect
  - Overdoses
- Injurious Environment
  - Access to Drug
  - Access to Paraphernalia
  - Cultivation

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Opioid Dependence and Parenting

- Recent review of 12 studies
- Children of parent with opioid dependence demonstrate:
  - Greater disorganized attachment
  - More avoidance
- Mothers with opioid dependence demonstrate:
  - More irritability, ambivalence, disinterest
  - Greater difficulty interpreting cues

Source: Romanowicz et al. The effects of parental opioid use on the parent-child relationship and children's developmental and behavioral outcomes: a systematic review of published reports. BMC Child and Adolescent Psychiatry and Mental Health 2019;13:5.

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Child Abuse and Neglect

- University of Iowa study (Oral R et al, 2011)
  - Children presenting for alleged child treatment from 2004 – 2008
  - 665 charts met study inclusion criteria for child abuse/neglect allegation
  - 232 cases were tested for illicit drugs per the testing protocol
  - 34 cases (14.7%) tested positive
  - Logistic regression analysis revealed that positive drug testing was most significantly associated with clinical symptoms suggesting physical abuse or neglect, no or public health insurance, history of parental drug abuse, and history of domestic violence
  - Study concluded that routine drug testing of at least children assessed for neglect and non-accidental burn and soft tissue injuries, children with a history of parental drug use or domestic violence is recommended

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Impact on Children

- Impaired Caregivers
  - Lack of Supervision
  - Lack of Necessities
  - Abuse or Neglect
  - Overdoses
- Injurious Environment
  - Access to Drug
  - Access to Paraphernalia
  - Cultivation

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Dealing & Trafficking






Presence of:

- Weapons
- Money
- Packaging
- Paranoia

Exposure to:

- Potential for Violence
- Potential for Burglary
- Organized Crime
- Unpredictable Environment
- Unknown Adults

Source: Detective Darren Bloom, Longmont, co Police Department, 2011

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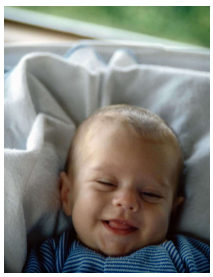
Substance Use and Infants/Children/Youth



- Youth Use
- Prenatal Exposure and Breastfeeding
- Caregiver impairment
- Environmental Exposure
- Manufacturing and Grows: Toxin/chemicals/molds exposure risk

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Drug Routes of Entry

- Ingestion – most common - hand to mouth behavior, lack of discretion in ingestion
- Inhalation – smoking
- Absorption – no warning
- Contact – skin and eyes
- Puncture – chemical injection

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Ingestions

- Opioids and sedative-hypnotics such as benzodiazepines are the most common classes of pharmaceutical agents involved with overall ingestions and those that lead to fatality in young children
- Usually unintentional
- Potential for intentional poisoning
  - Most common reported categories are analgesics, stimulants/street drugs, sedatives/hypnotics/antipsychotics, cold and cough preparations, and ethanol
  - History may be lacking

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Heroin & Fentanyl injected in candy

- Candy being laced with heroin and fentanyl
- User/ingester becomes very sleepy, groggy
- Breathing can become very shallow
- Death can occur

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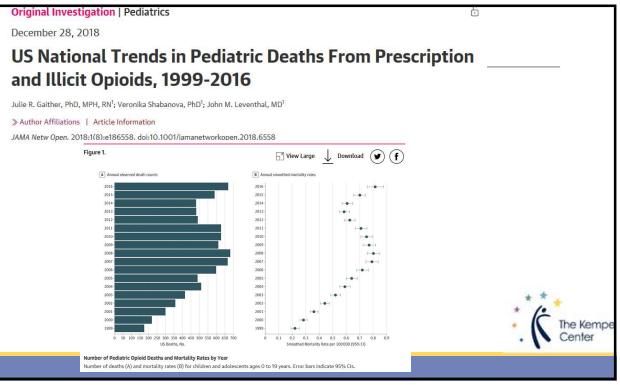

Original Investigation | Pediatrics

December 28, 2018

US National Trends in Pediatric Deaths From Prescription and Illicit Opioids, 1999-2016

Julie R. Gaither, PhD, MPH, RN[1]; Veronika Shabanova, PhD[2]; John M. Leventhal, MD[3]

Author Affiliations | Article Information

JAMA Netw Open. 2018;1(8):e186558. doi:10.1001/jamanetworkopen.2018.6558

Figure 1. View Large Download

Number of Pediatric Opioid Deaths and Mortality Rates by Year

Number of deaths (A) and mortality rates (B) for children and adolescents ages 0 to 19 years. Error bars indicate 95% CIs.

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Marijuana Exposures in Children

Boros et al, 1996
- 2 cases of cannabis-induced coma following accidental ingestion of cannabis cookies

Macnab et al, 1989
- British Columbia's Children's Hospital
- 6 children in 4 years with cannabis toxicity
  - 3 presented in coma, including one with airway obstruction

Appelboem and Oades, 2006
- Reviewed total of 9 cases reported to date
- Youngest recorded case was of an 11-month-old girl

Amirav et al, 2010
- Case of 18-month-old child who presented in coma after ingestion of cannibis

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Marijuana Ingestions Rising

- Legalization, increasing potency, edibles
- Systemic review of the literature describing the clinical effects and outcomes of unintentional marijuana exposures in children – 44 retrospective studies, case series, and case reports (Richards et al)
- Clinical impact is significant compared to other pediatric exposures (Wang et al, 2013)

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Exposure & Ingestion

Colorado Children's Hospital reports an increase in treatment of children (8 mo - 12 yr) for unintentional exposure to marijuana

- 2005 – 2009: 0 marijuana exposures
- 2009 – 2011: 14 marijuana exposures
  - 8 of the exposures were from medical marijuana
  - 7 of the exposures were from marijuana-infused food products
  - 8 admitted, 2 admitted to the pediatric intensive care unit
- Symptoms
  - 9 had lethargy
  - 1 had ataxia
  - 1 had respiratory insufficiency

(Source: Pediatric Marijuana Exposures in a Medical Marijuana State; GS Wang, G Roosevelt, K Heard; JAMA Pediatrics, July 2013; 167;7;630-633)

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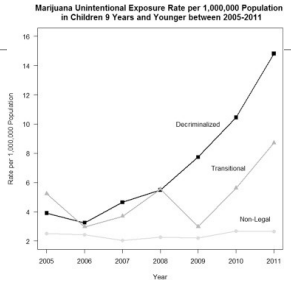

(Source: Wang, et al, 2014)

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Marijuana Exposure Acute Effects in Children

- Sleepiness, euphoria irritability, tachycardia, hypertension
- CNS depression, bradycardia, bradypnea, ataxia, vomiting, seizures
- Small cohort of 38 children presenting to an emergency department for acute marijuana intoxication after ingestion:
  - 3.2 mg/kg of THC led to observation and minimal medical intervention
  - 7.2 mg/kg of THC led to admission to an inpatient floor and moderate medical intervention
  - 13 mg/kg of THC led to admission to an intensive care unit and major medical interventions

(Source: G. Sam Wang, MD)

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Synthetic Cannabinoids

- Full CB1 Agonist, Variable receptor interactions
- Can have similar THC effects
- Tachycardia, agitation, sympathomimetic
- Seizures, psychosis
- Benzodiazepines, antipsychotics for agitation
- *Undetectable in UDS*

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Methamphetamine Poisoned Kids

- Arizona study
- 18 kids aged < 13 years
- Confirmed oral methamphetamine poisoning
- Drugs left out in easy access to kids
- Agitation (9), inconsolability (6), increased heart rate (18), abdominal pain, vomiting (6), seizures, muscle breakdown, fever (1), ataxia (1)
- Treatment included CT head (5), spinal taps (3), Spider *(Centruroides sculpturatus)* Antivenom (3)
- Anaphylaxis to antivenom (1)

(Source: Kolecki, 1998 *Ped Emerg Care* (1998) 14:385-387)

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Children Who Ingest Illegal Drugs

Few cases reported in the literature

- 11-month-old boy with irritability and transient cortical blindness/ involuntary turning of the head
- Symptoms resolved after 12 hours
- Mom's history: Found the infant chewing on a small plastic bag
- Tox studies of blood via GC/MS revealed meth value of 88 ng/ml

(Source: Gospe SM Jr, *Ann Emerg Med*, 1995, 26:380-2)

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Medical Effects on Children

Short-Term
- Similar to adults, but children are not just "small adults"
- Symptoms occur at lower doses (overdoses)

Long Term
- Unknown

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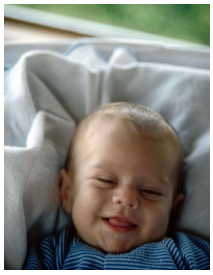
Substance Use and Infants/Children/Youth



- Youth Use
- Prenatal Exposure and Breastfeeding
- Caregiver impairment
- Environmental Exposure
- Manufacturing and Grows: Toxin/chemicals/molds exposure risk

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Environmental Hazards
Simulated Methamphetamine Smoking

- Used a standard motel room, smoked 2.45 g in a total of 4 "smokes", with none inhaled.
- Significant meth levels were present in the air during the smoke and present on all surfaces after the smoke.
- If meth has been smoked in a residence, it is likely that children present within that structure will be exposed to airborne and surface meth.

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Growing & Cultivating

Presence of:
- Growing Rooms
- Processing Rooms
- Hash Oil Labs

Hazards:
- Electrical
- Chemical
- Air Quality
- THC
- Mold & Fungus

(Source: Detective Darren Bloom, Longmont Police Department, 2011)




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Indications for Testing Beyond the Perinatal Period

- Exploratory ingestions
- Clinical scenarios/physical findings in the child (seizures, altered mental status)
- Known/suspected caregiver substance use
- Illness or injury potentially related to abuse and/or neglect
- Manufacture or distribution in the home

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Testing Protocols

- Drug testing can be used as a tool to guide medical treatment and identify children at risk from factors related to substance use by their caregivers (Farst et al, 2011; Grant et al, 2010)
- Clearly document objective indicator(s) for testing – relate to concern for health and/or safety

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Screening vs Confirmatory Screening

- Screening
  - Urine
  - Immunoassays
- Confirmatory
  - Urine, Blood, Hair
  - Gas or High-Performance Chromatography paired with Mass Spectroscopy

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Urine

Advantages
- Inexpensive
- Commonly available, easy to obtain (low volume)
- Rapid results for immunoassays
- Variation in panel

Disadvantages
- Typically require recent exposure (1-3 days)
- Difficult to correlate with intoxication/symptoms
- Difficult to determine timeline of exposure (outside of acute)
- Commonly available immunoassays have false positives and negatives
- Qualitative (yes/no)

(Sources: Goldfrank's Toxicologic Emergencies, 10e, 2015; Moeller KE, Mayo Clin Proc 2017; Smith MP, Clin Lab Med 2016; Hadland SE, Child Adolesc Psychiatr Clin N Am 2016)

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Potential Positives/Negatives on Urine Drug Screen

Drug Classification	Potential Positives	Potential Negatives
Amphetamines	ADHD medications Decongestants MDMA Buproprion	
Benzodiazepines	Diazepam Temazepam	Alprazolam Clonazepam Lorazepam
Cannabinoids (Marijuana)	Promethazine Efavirenz	
Opiates	Codeine Heroin Morphine	Semi-synthetic opioids Synthetic opioids
Phencyclidine	Dextromethorphan Ketamine Diphenhydramine	
TCA	Diphenhydramine Quetiapine Cyclobenzaprine	

Source: Goldfrank's Toxicologic Emergencies, 10e, 2015; Moeller KE, Mayo Clin Proc 2017; Smith MP, Clin Lab Med 2016.

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Hair

Advantages
- Subacute or chronic exposure (previous 3-6 months)
- Noninvasive

Disadvantages
- Risk of external contamination
  - *Parent compound: potential contaminant in environment*
  - *Metabolite: evidence for systemic exposure*
- Difficult to clinically correlate
- Difficult to determine timeline of exposure

(Source: Curtis J, Clin Toxicol (Phila) 2008)

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Blood

Whole blood, serum, plasma - type of blood will depend on specific drug being tested.

Advantages
- Can make better estimate on toxicity, but still need entire clinical picture
- Known literature to help clinically interpret results

Disadvantages
- Invasive
- Expensive
- Not rapid

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Expanded Comprehensive Drug Screens Available

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This Issue Requires that Multiple Agencies Work Together

- Comprehensive services & collaborative relationships
- Provided along a continuum of prevention, intervention and treatment from pre-pregnancy through childhood
- At different developmental stages in the life of the child and family
- Education & Treatment are critical

NO single agency can deliver all of these

(Source: Gardner S & Young N, National Center on Substance Abuse and Child Welfare)

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Gathering Information

Ask the Parent

- Tell me more about your use. How often? For what purpose? What are you like when you use?
- Where are your children when you use?
- How do you store your marijuana?
- What steps have you taken to protect your children?

Ask Yourself

- Do I believe that the conditions in this home could reasonably result in harm to a child?

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Factors to Consider

- Age & Vulnerability of the Child
- Children's Medical & Developmental Needs
- Accessibility of the Substance
- Sober Caregivers
  - Level of Impairment
  - Use Patterns
  - Presence of Other Caregivers
- Environmental Aspects
  - Second Hand Smoke
  - Cultivation Aspects
  - Distribution Risks
  - Living Conditions
  - Domestic Violence

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Mandated Reporting

- Understand state-specific mandated reporting laws
- Response variability (McGlade, 2009)
  - Identified substance
  - Clinical scenario
  - Environmental Risk

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Involving Child Welfare and/or Law Enforcement

- Mandatory Reporting
  - To have reasonable cause to know or suspect that a child has been abused or neglected
  - To have observed conditions which would reasonably result in abuse or neglect
  - Testing Positive at Birth?
- Illegal Activity
  - Drug Distribution
  - Manufacturing

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Parental Substance Use as Child Abuse

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Key Messages for Parents

- Every child needs an aware, involved, engaged caregiver – parent, grandparent, babysitter
- Provide age appropriate supervision, nutrition, connection
- Crisis Ready – able to respond and ensure child health, safety, and well being in any situation

Safe Sober Caregiver

- Drug & Paraphernalia Storage - lock box, child proof packaging, *stash your stash*
- Environmental Factors – smoke free zone, homes free from drug dealing, meth labs / precursor chemicals, unsafe grows, hash oil labs, violence, strangers, criminal activity

Safe Healthy Home

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Pregnancy
Key Messages

- Anything you eat, drink, smoke or are exposed to can affect your baby
- Talk to your doctor about all medications, supplements, vitamins
- Review ways to stop or reduce use of anything that can negatively affect you or your baby.
- Stopping or reducing use at any point during the pregnancy will benefit both you and your baby.
- Partner's use matters too
- Plan for the future – breastfeeding, caregiving, etc.

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Breastfeeding
Key Messages

- Many of the things you consume, including what you eat, drink or smoke, have the potential to pass through your breast milk to your nursing baby - medications, supplements, alcohol, caffeine, tobacco, marijuana or street drugs.
- Check with your doctor about anything you might take or consume while breastfeeding.
- Use of a substance may also affect your ability to engage, connect, bond and care for your child.
- If you are using any substances, ensure your child always has a safe home, a responsible caregiver, and a sleeping arrangement

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Young Children
Key Messages

- Attending to children's basic needs - food, clothing, shelter, healthcare, and hygiene
- Being within eyesight or earshot of children at all times - napping, sleeping, indoor, & outdoor activities
- Never leaving children home alone or unattended
- Providing clear expectations and rules
- Securing all potential hazards
- Being engaged in meeting child's developmental needs - reading, puzzles, play, other age appropriate activities
- Being physically and mentally capable of responding in case of emergency

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Things to Consider

- Safe Homes
  - Practice Safe Storage, Secure All Hazards, Smoke Free Zones
- Safe Caregivers
  - Be Aware & Know the Risks of Substance Use
  - Choosing a Caregiver
  - Take Care of Yourself & Build Support System
- Healthy Babies & Toddlers
  - Show Your Love
  - Stay Up to Date on Parenting & Child Development
  - Learn How to Calm a Crying Baby
  - Safe Sleep Arrangements
  - Promote Stability

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Key Points

- The earlier the better… but any time is better than never!
- Substance use and child maltreatment is complicated
- Collaboration is key!

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Therapy!

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