October 22, 2019

38th Annual Michigan Statewide Conference: Child Abuse and Neglect

"Substance Exposed Newborns: Medical and Legal Issues"

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NYC HEALTH+ HOSPITALS | Bellevue

NYU School of Medicine
NYU LANGONE MEDICAL CENTER

HASSENFELD CHILDREN'S HOSPITAL OF NEW YORK AT NYU LANGONE

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Vincent J. Palusci, M.D., M.S.

- I and my immediate family have neither financial relationships with nor significant direct investment in related commercial entities.
- I do not plan to discuss off-label uses of pharmaceuticals or medical equipment.
- The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the AAP, APSAC, or the U.S. Centers for Disease Control and Prevention.

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Presentation Summary

- This session will provide an overview of the physiological impacts of in utero exposure to alcohol and drugs (e.g., opioids, cocaine, and marijuana). It will then provide an overview of relevant federal and state laws relating to substance exposed newborns.
- Part One: Medical Issues
  - Vincent J. Palusci, MD, MS, FAAP
- Part Two: Legal Issues
  - Frank E. Vandervort, JD

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Learning Objectives

Upon completion of this activity, participants will:

1. learn about the effects of maternal use of alcohol and various drugs on the developing fetus.
2. will have an understanding of the postnatal management of alcohol and drug exposed infants (DEI) children.
3. will understand the federal framework provided in the Child Abuse Prevention and Treatment Act and in Titles IV-B and IV-E for handling cases of DEIs
4. will understand Michigan law regarding the status and response to DEIs.

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PRENATAL DRUG EXPOSURE & DRUG-EXPOSED INFANTS

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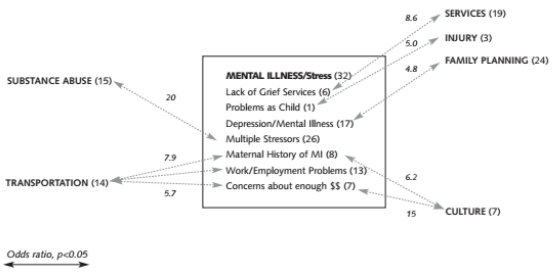
Figure 2: Mental Health and Stress Factor Group Association Modeling

(AA mothers only, N=44), FIMR Case Reviews



Kent County Fetal Infant Mortality Review, 2004

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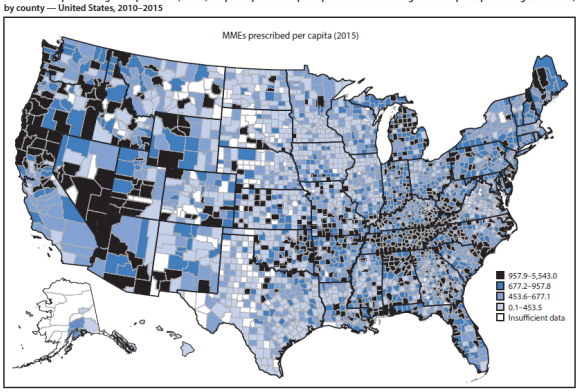

Guy, MMWR, 2017

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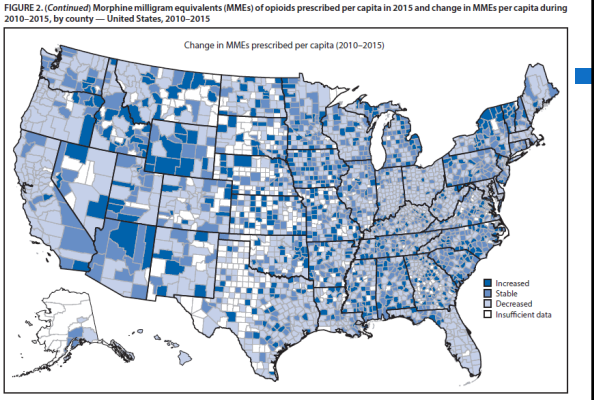

Guy, MMWR, 2017

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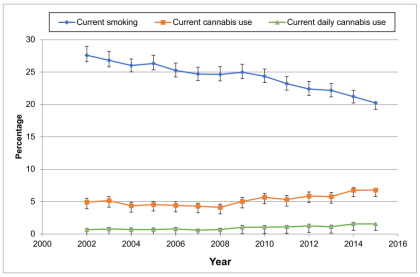

FIGURE 1
Prevalence of current smoking, current cannabis use, and current daily cannabis use among adult parents with children aged <18 years in the household, by year, NSDUH 2002–2015. Error bars represent 95% confidence intervals around prevalence estimates. All *P* values for trend, *P* < .0001 both unadjusted and adjusted for sex, age, marital status, education, income, and race and/or ethnicity.

Goodwin RD, Cheslack-Postava K, Santoscoy S, et al. Trends in Cannabis and Cigarette Use Among Parents With Children at Home: 2002 to 2015. *Pediatrics.* 2018;141(6):e20173506

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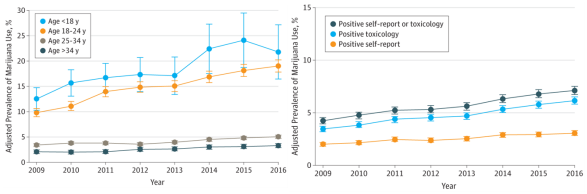
Marijuana Use Increasing; Self-Report Unreliable



Adjusted Prevalence of Marijuana Use Among 279 457 Pregnant Females in KPNC by Screening Type, 2009-2016KPNC indicates Kaiser Permanente Northern California. JAMA. 2017;318(24):2490-2491. doi:10.1001/jama.2017.17225

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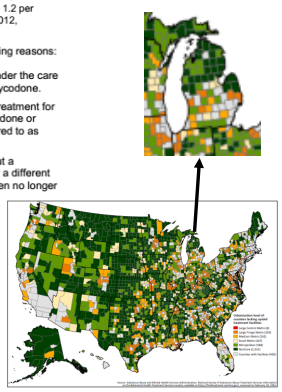
Prenatal maternal opioid use has increased considerably in recent years. This increase has contributed to a significant rise in the rate of NAS. According to a recent study, the rate of NAS has increased from 1.2 per 1,000 hospital births in 2000 to 5.8 per 1,000 hospital births in 2012, reaching a total of 21,732 infants diagnosed with NAS.[22]

Opioid exposure during pregnancy may occur for the following reasons:

- Women receiving pain medication with a prescription under the care of a physician. Medications can include fentanyl and oxycodone.
- Women under the care of a physician and undergoing treatment for an opioid use disorder with medications, such as methadone or buprenorphine. This type of treatment is generally referred to as medication-assisted treatment (MAT).
- Women misusing opioid pain medications with or without a prescription (such as using without a prescription, using a different dosage than prescribed, or continuing to use a drug when no longer needed for pain).
- Women using or abusing illicit opioid, such as heroin.



GAO

SUBSTANCE-AFFECTED INFANTS

Additional Guidance Would Help States Better Implement Protections for Children

Figure 2. Counties with No Opioid Treatment Program Facilities by Level of Urbanization

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Prevalence of Maternal Substance Abuse in a Community Hospital

C.E. Pippenger PhD, Neda Riahi MD, Vincent Palusci MD, Barbara Bradley MD, Sandra Bierling MD, Suzanne Rogers RN, George Sturm PhD, Curtis Cook MD, Peter C. and Pat Cook Health Sciences Research and Education Institute, DeVos Children's Hospital and Butterworth Hospital, Grand Rapids, MI

BACKGROUND: Studies regarding the incidence rate of substance abuse among pregnant women and the adverse health effects associated with in-utero drug exposure have involved primarily populations in large metropolitan settings. Prevalence rates in published studies have ranged from 0.4% (rural) to 27% (urban).

METHODS: We determined the prevalence of illicit drug use in sequential pregnant patients delivering in a 550 bed regional hospital (Level III Regional Perinatal Center) that serves a thirteen county area of Western Michigan. This area includes Grand Rapids, a city of 200,000 and a catchment population of approximately 1.5 million. During a three month period, there were 891 births of which 461 mother-infant pairs were entered in the study. Mothers' urine was collected at admission and their newborn's meconium collected and screened by immunoassay (EMIT) for amphetamines, cocaine, tetrahydrocannabinol, methadone, methaqualone, propoxyphene, phencyclidine, opiates, benzodiazepine, barbiturates, and ethanol. Positive results were confirmed by GC/MS. Mother's socio-demographic data and medical history were recorded upon admission.

2001

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Kent County, 2001

RESULTS: The overall prevalence of illicit drug use was 6.94%. While the majority (3.25%) abused marijuana, opiate abuse was 1.08% and cocaine abuse was 0.87%. No other illicit drugs were detected. During the study period, 10 drug-exposed infants were reported to Child Protective Services independent of the study procedures. Statistical analysis confirms there was no bias in selection of the mother-infant pairs. The observed prevalence rates are applicable to the total population. Factors associated with substance abuse during pregnancy in this population were: Divorced or Single (P=0.000), history of drug abuse treatment (P=0.005), blacks and Hispanics (P=0.041), less education versus Master's Degree (P=0.048), and history of drug abuse in a sexual partner (P=0.010).

CONCLUSIONS: This study confirms a low incidence of drug abuse in the obstetrical population admitted for delivery in a 550 bed regional hospital. While low compared to studies among urban populations, this is a significant rate of illicit substance abuse during pregnancy in a community hospital population. This highlights the importance of ongoing prevention and early identification of substance abuse in all communities.

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MATERNAL RISK FACTORS

Prenatal Factors

- **Recent death of a loved one**
- **Previous loss of or serious illness in another child**
- **History of depression or serious mental illness**
- **Troubled relationship with parents**
- **Lack of a positive parenting model/poor parenting experience**
- **Financial stress or job loss**
- **Marital discord or poor relationship with the other parent**
- **Recent move or no community ties**
- **Poor social network**
- **History of fertility problem or miscarriages**
- **Unwanted pregnancy**
- **Drug and/or alcohol abuse**
- **Prior experience with CPS/removal of a child**
- **Extreme immaturity**

From *Dixon SD, Stein MT: Encounters with Children: Pediatric Behavior and Development, 3rd ed. St. Louis, Mosby, 2000, p 74. and Nelson's Textbook of Pediatrics, 18th ed.*

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Types of Maltreatment

- Direct/indirect exposure to toxic agents
- Physical Abuse
- Neglect- acute and chronic
- Exposure to violence
- Chronic exposure to trauma- physical/sexual abuse, partner violence, witnessing violent acts, such as homicide, suicide, OD's

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Prenatal Drug Exposure

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- Placental Transfer
- Effects on Fetus
- Pregnancy Complications-
  - maternal
  - fetal

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Prenatal Drug Use

Risks for fetus:

nutritional, infectious, premature labor, placental abruption, spontaneous abortion, increased rate of GU malformations, abnormal behavior in neonatal period, and possible increased risk of sleep disorders

http://www.cocaineaddiction.com/cocaine.html

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Most Common Drugs of Abuse

- Past month use for those >12 years:
- In descending order: Marijuana
  - Psychotherapeutics
  - Cocaine
  - Hallucinogens
  - Inhalants
  - Heroin

www.oas.samhsa.gov

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Drug use in pregnancy

- Illicit drugs in pregnancy (2015)
  - 4.7 % in pregnant women 15-44 years (2015)
    - 7.4% in pregnant women 18-25 years old
- Legal drugs in pregnancy
  - 13.6% smoke cigarettes (11.4% in 2014)
  - 9.3% use alcohol (8.8% in 2014)
- Commonly multiple drugs
- Of the 4 million annual births in the U.S., it is estimated that 440,000 infants are exposed to drugs and alcohol per year
  - Only 5% of these are detected at birth

Patrick, 2017

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Drugs: Effects on Pregnancy, Fetus and Child

Nicotine

- No withdrawal syndrome for baby
- ↑ Spontaneous abortion
- ↑ Placental problems
- Prematurity
- Poor fetal and postnatal growth
- Oral-facial deformities
- ↑ SIDS risk
- Slightly lower IQ scores
- Poor language development

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Fetal Alcohol Spectrum Disorders (FASD)

Fetal Alcohol Spectrum Disorders (FASD) is an umbrella term describing the range of effects that can occur in an individual whose mother drank alcohol during pregnancy.

These effects may include physical, mental, behavioral, and/or learning disabilities with possible lifelong implications. The term FASD is not intended for use as a clinical diagnosis

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Fetal Alcohol Spectrum Disorder (FASD)

- A pattern of lifelong physical, mental and neurobehavioral birth defects associated with alcohol consumption during pregnancy.
- FASD is the leading known preventable cause of mental retardation and birth defects.
- Often not medically diagnosed
- Incidence rate is approximately 1-3/1000
- Linked highly with risk of child abuse and neglect reports/ investigations

No **amount of alcohol in pregnancy is considered unequivocally safe -** AAP, ACOG

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"Alcohol is alcohol" regardless of form

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Features of FASD

- Overall pattern of facial features rather than specific individual facial characteristics
- Small eye openings
- Smooth and long philtrum (between nose and lip)
- Thin upper vermilion (i.e., narrow red margin of the upper lip)
- Increased inner canthal distance (between eyes)
- Elongated midface

Most children with FASD do NOT have the facial syndrome

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Children With FASD

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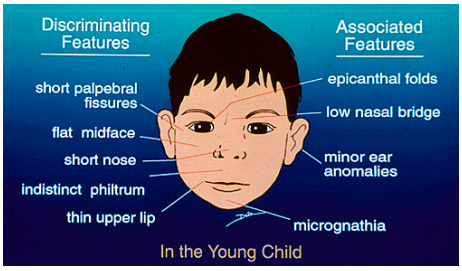
FASD – Facial Features



Severe FASD is called Fetal Alcohol Syndrome

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Вы планируете беременность? У вас задержка? Вы беременны?

ПОДУМАЙТЕ, ПРЕЖДЕ ЧЕМ ВЫПИТЬ

Здоровье Вашего ребенка – Ваш выбор!

КАК АЛКОГОЛЬ, который употребляет беременная женщина, ВЛИЯЕТ НА РЕБЕНКА?

Алкоголь является «тератогеном» - токсичным веществом, поражающим будущего ребенка.

ФАС – фетальный алкогольный синдром

ФАСН – фетальный алкогольный спектр нарушений

ФАС – это одна из основных причин умственной отсталости, которую можно предотвратить.

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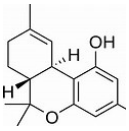
Illegal Drugs: Effects on Pregnancy, Fetus and Child

Marijuana



- Psychoactive ingredient is THC (tetrahydrocannabinol)
- Withdrawal with nausea/vomiting in mother
- ? Abstinence–like withdrawal syndrome
- ↑ levels of dysfunctional labor, meconium staining (sign of fetal stress)
- Altered uterine blood flow
- Produces 5x amount of carbon monoxide as cigarette smoking
- ↑ Startles and tremors in newborn, Abnormal cry analysis
- Abnormal EEG and sleep patterns to age 3
- 10-fold ↑ in certain Leukemias
- ↑ rates of juvenile delinquency?

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Canadian study, 2019

- 661 617 women, 1.4% reported cannabis use during pregnancy.
- The crude rate of preterm birth less than 37 weeks' gestation was 6.1%among women who did not report cannabis use and 12.0% among those reporting use in the unmatched cohort (RD, 5.88%[95%CI, 5.22%-6.54%]).
- In the matched cohort, reported cannabis exposure was significantly associated with an RD of 2.98%(95%CI, 2.63%-3.34%) and an RR of 1.41 (95% CI, 1.36-1.47) for preterm birth.
- Compared with no reported use, cannabis exposure was significantly associated with greater frequency of small for gestational age (third percentile, 6.1% vs 4.0%; RR, 1.53 [95%CI, 1.45-1.61]), placental abruption (1.6%vs 0.9%; RR, 1.72 [95% CI, 1.54-1.92]), transfer to neonatal intensive care (19.3%vs 13.8%; RR, 1.40 [95%CI, 1.36-1.44]), and 5-minute Apgar score less than 4 (1.1% vs 0.9%; RR, 1.28 [95%CI, 1.13-1.45]).
- Daniel J. Corsi, PhD; Laura Walsh, MSc; Deborah Weiss, PhD; Helen Hsu, MD; Darine El-Chaar, MD; Steven Hawken, PhD; Deshayne B. Fell, PhD; MarkWalker. Association Between Self-reported Prenatal Cannabis Use and Maternal, Perinatal, and Neonatal Outcomes. JAMA. 2019;322(2):145-152. doi:10.1001/jama.2019.8734

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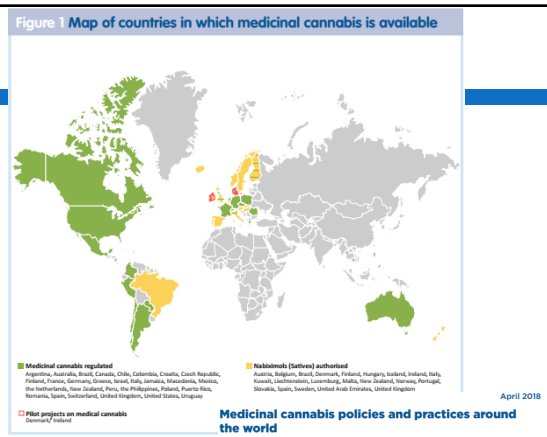

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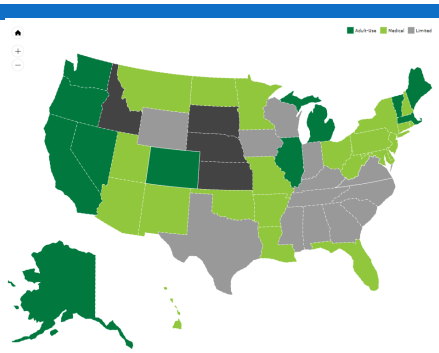
State Marijuana Laws, 2019



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U.S. Surgeon General's Advisory August, 2019

HHS.gov

U.S. Department of Health & Human Services

Office of the Surgeon General

U.S. Surgeon General's Advisory: Marijuana Use and the Developing Brain

I, Surgeon General VADM Jerome Adams, am emphasizing the importance of protecting our Nation from the health risks of marijuana use in adolescence and during pregnancy. Recent increases in access to marijuana and in its potency, along with misperceptions of safety of marijuana endanger our most precious resource, our nation's youth.

KNOW THE RISKS. TAKE ACTION. PROTECT OUR FUTURE.

Background

Marijuana, or cannabis, is the most commonly used illicit drug in the United States. It acts by binding to cannabinoid receptors in the brain to produce a variety of effects, including euphoria, intoxication, and memory and motor impairments. These same cannabinoid receptors are also critical for brain development. They are part of the endocannabinoid system, which impacts the formation of brain circuits important for decision making, mood and responding to stress1.

Marijuana and its related products are widely available in multiple forms. These products can be eaten, drunk, smoked, and vaped2. Marijuana contains varying levels of delta-9-tetrahydrocannabinol (THC), the component responsible for euphoria and intoxication, and cannabidiol (CBD). While CBD is not intoxicating and does not lead to addiction, its long-term effects are largely unknown, and most CBD products are untested and of uncertain purity3.

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Please note…

CBD ≠ THC

- CBD is Cannabidiol, a phytocannabinoid discovered in 1940. It is one of some 113 identified cannabinoids in cannabis plants and accounts for up to 40% of the plant's extract.
- CBD does not have the same psychoactivity as THC
- Few studies on newborns and children

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Illegal Drugs: Effects on Pregnancy, Fetus and Child

Cocaine

- ↑ Spontaneous abortions, abruptio placentae
- ↑Preterm labor
- Reduced fetal growth
- Congenital defects such as microcephaly and intestinal atresia
- ↑ risk of SIDS
- Long term neurobehavioral effects
- No documented withdrawal

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Illegal Drugs: Effects on Pregnancy, Fetus and Child

Heroin and Methadone

- Decreased brain growth
- Increased risk of prematurity
- Severe withdrawal symptoms; may last 30 days
  - Vomiting, diarrhea, irritability, salivation, sneezing
  - Incessant hunger
  - Sleep disturbances
  - Tremors, seizures, muscular rigidity
  - Shrill high-pitched cry
  - Poor feeding
  - Hyperventilation

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Illegal Drugs: Effects on Pregnancy, Fetus and Child

Opiates: Long Term Issues

- Early abnormalities not predictive of future
- ↑ Hyperactivity/short attention span
- Inconsistent findings on cognition
- No identified effects on language

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Effect of Drug Use During Pregnancy

- A pregnant woman takes **methamphetamine:**
  - Methamphetamine is chemically related to amphetamine, which causes the heart rate of the mother and fetus to increase.
- Methamphetamine can affect an unborn baby**:**
  - The use of speed can cause the fetus to get less oxygen, which can lead to a small baby at birth.
  - Methamphetamine can also increase the likelihood of premature labor, miscarriage, and placental abruption.
  - Babies can be born addicted to methamphetamine and suffer withdrawal symptoms that include:

    Tremors ,sleeplessness, muscle spasms

    Difficulties feeding

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EVALUATION & TESTING

Overview

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Leading Experts in Women's Health Care, Pediatrics & Addiction Medicine: "Pregnant Women with Substance Use Disorders Need Health Care, Not Incarceration"

1/19/2018

Washington, DC *– The American College of Obstetricians and Gynecologists (ACOG), the American Academy of Pediatrics (AAP), the American Society of Addiction Medicine (ASAM), March of Dimes and the National Organization on Fetal Alcohol Syndrome (NOFAS) released the following statement in response to the policy instituted by the Big Horn County Attorney's Office in Montana to prosecute and incarcerate pregnant women for drug/alcohol use:*

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Maternal Treatments

- Abstinence
- Substance abuse/addiction counseling
- Medications: Buprenorphine and methadone
  - Approved to treat opioid use disorder in pregnancy
  - Mother: decreased risk of overdose, heath, relapse, Hepatitis C, HIV
  - Baby: More likely to go to term, higher birthweight, risk of NAS

Patrick, 2017

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ACOG COMMITTEE OPINION

Number 711 • August 2017 *(Replaces Committee Opinion Number 524, May 2012)*

Committee on Obstetric Practice
American Society of Addiction Medicine

The Society of Maternal–Fetal Medicine endorses this document. This Committee Opinion was developed by the American College of Obstetricians and Gynecologists' Committee on Obstetric Practice in collaboration with committee members Maria A. Mascola, MD, MPH; Ann E. Borders, MD, MSc, MPH; and the American Society of Addiction Medicine member Mishka Terplan, MD, MPH.

Opioid Use and Opioid Use Disorder in Pregnancy

ABSTRACT: Opioid use in pregnancy has escalated dramatically in recent years, paralleling the epidemic
observed … e an active
role. Pre… disorders.
Substanc… and affect
women i… Screening
for subst… enatal visit
in partne… rse group,
and it is i… id misuse,
and untre… lopmental,
and socia… or neonatal
abstinenc… s engaging
a patient in a short conversation, providing feedback and advice), and referral for treatment of pregnant women with opioid use and opioid use disorder improve maternal and infant outcomes. In general, a coordinated multidisciplinary approach without criminal sanctions has the best chance of helping infants and families.

SCREENING ≠ TESTING

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NYU Nursing Protocol, 2019

- Maternal patients will have urine testing for substance abuse when at least 1 of the following criteria is met:
  - Unable to produce prenatal care information for at least 3 visits in a term pregnancy and/or evidence of absent, late or inadequate prenatal care in the preterm pregnancy. This includes "walk in "patients who are seeking emergency/ temporary care.
  - Reports "recent" substance abuse/use (illicit or prescribed). "Recent" will be considered substance use/ abuse in the last 2 months.
  - TAPs 2/ CIWA portions of the screening are triggered in the EMR
- Maternal Patients will be highly considered for urine testing for substance abuse when one or a combination of the following criteria are found:
  - Behavior suggesting substance abuse: somnolent/ sleepy; hyperactivity; severe mood swings; drug seeking.
  - Physical Assessment suggesting substance abuse: Track marks, poor dentition, poor nutritional status; deficits in self- care/ appearance.
  - Medical History suggesting substance abuse: CVAs, MI, reported past substance abuse or rehab, mental illness; high risk sexual behavior/ STDs.
  - Social History suggesting risk for substance abuse: Substance abuse behavior in significant others reported or observed, Law enforcement involvement, minor children not living with mother.
  - Obstetric History and current pregnancy, not limited to: unexplained late fetal demise; precipitous labor; abruptio placentae; unexplained hypertensive episodes; repeated spontaneous abortions.

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Newborn Evaluation

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- Acute Problems
  - respiratory distress
  - physical exam findings
- Toxicology Screening
- Drug Withdrawal
- Physical and developmental assessment

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Delivery Related Concerns

- **Inadequate prenatal care**
- **Risk factors identified duing psychosocial assessment / screening**
- **Type of delivery- ex-camera, precipitous**
- **Status of mother at time of delivery- intoxicated, unable to focus**
- **Status of infant at delivery- in distress, hypotonic, respiratory problem**

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SIGNS OF WITHDRAWAL

The timing of use and type of drug:

- **>1wk btw maternal use and delivery, the incidence of withdrawal is relatively low.**
- **the longer the half-life of elimination, the later the withdrawal tends to occur**
  - **ETOH- begins early; within 3-12 hrs after delivery**
  - **Narcotics- first 48-72 hrs, but can be delayed as late as 4 wks; subacute signs may last up to 6 months**
  - **Sedatives- after the first few days**
  - **Barbituates- median onset 4-7 days**

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SIGNS OF WITHDRAWAL

- **NEONATAL ABSTINENCE SYNDROME (NAS):**
  - **constellation of signs and symptoms exhibited by infants with drug dependencies.**
  - **Multisystem disorder that frequently involves the CNS, GI and Autonomic systems.**
    - **CNS: tremors, irritability, increased wakefulness/ poor sleep patterns, excessive high-pitched crying, increased muscle tone, hyperactive deep tendon reflexes, exaggerated Moro, seizures frequent yawning and sneezing**
    - **GI: feeding difficulties, vomiting, uncoordinated and constant sucking, diarrhea, dehydration, poor weight gain**
    - **Autonomic Signs: increased sweating, tachypnea, nasal stuffiness, fever, mottling, temperature instability.**

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AAP, Committee on Drugs. Neonatal Drug Withdrawal. *Pediatrics* 1998; 101; 1079-1088.

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Narcotic Abstinence Syndrome (NAS)

- Should be narcotic *withdrawal* syndrome
- Experience by drug exposed infants after birth
- Generally follows opioid exposure, although other drugs also implicated:
  - Alcohol, benzodiazepines, barbiturates
- 40-80% of heroin and methadone exposed babies (that we know about) develop NAS:
  - 5% of those exposed to opioid pain relievers

Patrick, 2017

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NAS Quebec: 2005-6 vs 2015-16

- 10 027 mother-infant dyads with NAS.
- The incidence of NAS increased from 0.20% to 0.51%.
- Maternal mortality was 1.99 vs 0.31 per 10 000 women in the NAS group versus the comparison group (aOR 5 6.53; 95% CI: 1.59 to 26.74), and maternal mortality and/or severe morbidity rates were 3.10% vs 1.35% (aOR 5 2.21; 95% CI: 1.97 to 2.49).
- Neonatal mortality was 0.12% vs 0.19% (aOR 5 0.28; 95% CI: 0.15 to 0.53), and neonatal mortality and/or severe morbidity rates were 6.36% vs 1.73% (aOR 5 2.27; 95% CI: 2.06 to 2.50) among infants with NAS versus without NAS.
- Lisonkova S, Richter LL, Ting J, et al. Neonatal Abstinence Syndrome and Associated Neonatal and Maternal Mortality and Morbidity. Pediatrics. 2019; 144(2):e20183664

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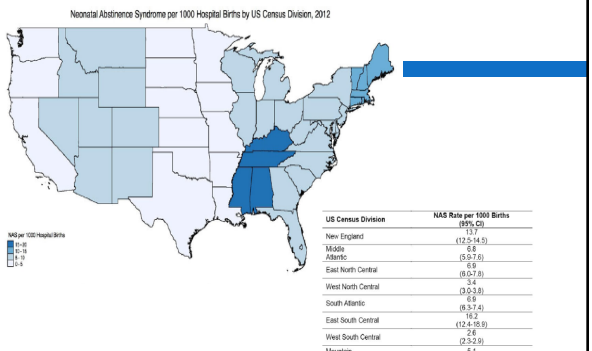

US Census Division	NAS Rate per 1000 Births (95% CI)
New England	13.7 (12.5-14.5)
Middle Atlantic	6.8 (5.9-7.6)
East North Central	6.9 (6.0-7.8)
West North Central	3.4 (3.0-3.8)
South Atlantic	6.8 (6.3-7.4)
East South Central	16.2 (12.4-18.9)
West South Central	2.6 (2.3-2.9)
Mountain	5.1
	(4.6-5.5)
Pacific	3.0 (2.7-3.3)

Patrick, J Perinat, 2012

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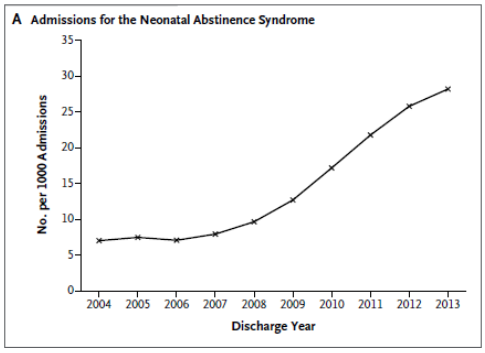

Patrick, NEJM, 2015

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NAS Scoring

- Tools have not undergone rigorous research
- Significant interrater reliability challenges
- Scoring cut-point theachold
- Never been tested in preterm infants
- Only tested on pure opioid population
- Average LOS 6d (Finnegan)

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NAS Treatment

- Goal is to control withdrawal and minimize complications (feeding, seizures, sudden death)
- Non pharmacologic interventions such as controlling environment, swaddling gaining recent attention
- With pharmacotherapy, treat with an opioid such as morphine or methadone and slowly taper dose
- Much inter-hospital variability in protocols, assessment, treatment and CPS reporting
- Differences in care within same institution (newborn nursery, vs. NICU vs. general inpatient wards)

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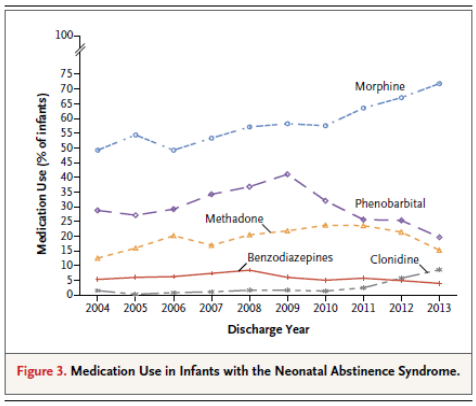

Figure 3. Medication Use in Infants with the Neonatal Abstinence Syndrome.

Patrick, NEJM, 2015

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Nonpharmacologic interventions

(1) Infants were placed in a low stimulation environment with dimmed lights, muted televisions, and reduced noise.

(2) Staff engaged parents continuously in the care of their infants (volunteers were used if a family member was not available); parents were strongly encouraged to room-in, to feed their infants on demand, and to tend to their infant if crying.

(3) Staff were trained to view nonpharmacologic interventions as equivalent to medications; when increased intervention was warranted, the approach was to increase the involvement of the parents before using pharmacologic treatment.

(4) In conjunction with the well-baby nursery (WBN), we encouraged breast-milk feeding of all infants for whom there were no contraindications (ie, illicit drug use or HIV).

(5) Decreased hospital stay from 22 to 6 days, decreased use of drugs from 98% to14% with no readmissions and no adverse events.

To cite: Grossman MR, Berkwitt AK, Osborn RR, et al. An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome. *Pediatrics*. 2017;139(6):e20163360

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Discharge Assessment

- Discharge of an infant – assessment to a potentially dangerous environment
  - breastfeeding safe, also less used
  - increasingly discharged home on medication
  - lack of supports- intergenerational issues
  - maternal history of victimization (3/4)
  - psychiatric co-morbidities
  - coexisting domestic and interpersonal violence
  - more ED visits and re-admissions
  - increased risk of fussiness, feeding problems:
    - => abuse/neglect

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Drug Testing

- Screening vs. Confirmation
- Specific Testing
- Usefulness
- Limits of testing

A Public Health Response to Opioid Use in Pregnancy

Stephen W. Patrick, MD, MPH, MS, FAAP,[a,b,c,d,e] Davida M. Schiff, MD, FAAP,[f] COMMITTEE ON SUBSTANCE USE AND PREVENTION

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Commonly Used Drug Screens

Group	What is Detected
Amphetamine	Amphetamine, Meth
Barbituates	Phenobarbital, others
Cocaine	Benzoylecgonine
Marijuana*	Tetrahydrocannabinol
Opiates	Morphine, which is a metabolite of heroin and many opioids
PCP	PCP (phencyclidine)

Hoffman RJ, Nelson N. Rational Use of Toxicology Testing in Children. Current Opinions in Pediatrics 2001: 13: 183-188

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Often not detected unless specifically looked for

- Antidysrythmics
- Anticholinergics
- Anticoagulants
- Antipsychotics
- Calcium channel blockers
- Carbon monoxide
- Cyanide
- Designer drugs
- Benadryl

- Ethylene glycol
- Fentanyl
- Hyroxybutyrate
- Ketamine
- Lithium
- LSD
- Methanol
- SSRIs
- Strychnine
- Tricyclics

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Drug Testing

- Urine / Blood
  - Blood often used for alcohol
  - Must be collected STAT
  - Needs a confirmatory test (immunoassay test)
  - May test negative at low levels due to standards used (workplace levels)
- Hair / Meconium
  - Longer window of exposure
  - Can mirror environmental/systemic exposure
  - May be missed
- Umbilical Cord
  - Less likely to be lost
  - Results compatible to meconium

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OUTCOMES

Physical
Psychological and Developmental

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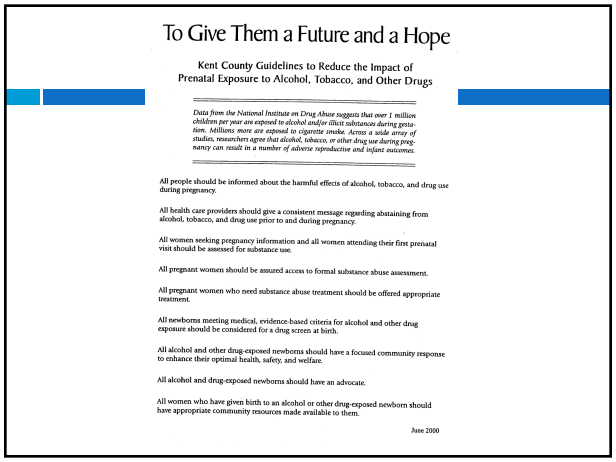

To Give Them a Future and a Hope

Kent County Guidelines to Reduce the Impact of Prenatal Exposure to Alcohol, Tobacco, and Other Drugs

Data from the National Institute on Drug Abuse suggests that over 1 million children per year are exposed to alcohol and/or illicit substances during gestation. Millions more are exposed to cigarette smoke. Across a wide array of studies, researchers agree that alcohol, tobacco, or other drug use during pregnancy can result in a number of adverse reproductive and infant outcomes.

All people should be informed about the harmful effects of alcohol, tobacco, and drug use during pregnancy.

All health care providers should give a consistent message regarding abstaining from alcohol, tobacco, and drug use prior to and during pregnancy.

All women seeking pregnancy information and all women attending their first prenatal visit should be assessed for substance use.

All pregnant women should be assured access to formal substance abuse assessment.

All pregnant women who need substance abuse treatment should be offered appropriate treatment.

All newborns meeting medical, evidence-based criteria for alcohol and other drug exposure should be considered for a drug screen at birth.

All alcohol and other drug-exposed newborns should have a focused community response to enhance their optimal health, safety, and welfare.

All alcohol and drug-exposed newborns should have an advocate.

All women who have given birth to an alcohol or other drug-exposed newborn should have appropriate community resources made available to them.

June 2000

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Psychological & developmental outcomes

- More likely to be victims of severe and chronic neglect
- More likely to have families with problems
- Evaluate exposures to other trauma

Walsh C et al. The relationship between parental substance abuse and child maltreatment…Child Abuse & Negl. 27 (2003) 1409-25

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Psychological & developmental outcomes

- KY: Children living with primary caregivers who are actively misusing drugs and alcohol
- Open CPS cases of these DEC children
- DEC vs. non-DEC: Greater exposure to:
- Traumatic events
- Intimate partner violence
- Child endangerment
- Physical abuse by a family member
- Chemical exposure
- Other traumatic events

Sprang, G.et all: Trauma Exposure and the Drug Endangered Child. J of Traumatic Stress: 21: 3: June 2008: 333-339

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Physical

- Prenatal vs. postnatal exposure
- One study noted the effect of prenatal cocaine exposure on growth:
  Children exposed to cocaine during the first trimester were smaller on all growth parameters at 7 and 10 years but not at 1 or 3 years
- Children who were prenatally exposed to cocaine grew at a slower rate than those who were not exposed

Richardson G. Goldschmidt L. Larkby C. Pediatrics 120: 4: October 2007: e1017-26

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Clinical Outcomes of children exposed postnatally to drugs of abuse

- Children of heroin addicted mothers: psychological and social problems
- Behavior disturbances in children ages 12-24 months
- Delayed language development in heroin-exposed children 24-32 months of age
- Pre-school aged children of methadone maintenance mothers: More impulsive, immature, and irresponsible. Performed more poorly on intelligence tests
- Decreased IQ scores among 3-7 year old children of MM
- Learning problems and behavioral disturbances were reported in 1 study in 1973

Johnson JL, Leff M. Children of Substance Abusers… Peds 1999 Suppl. 1085-1099

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Substance Abuse and CPS

- In a study of 119 infants of substance-abusing mothers (disclosed opiate, amphetamine) and 238 matched controls (some in treatment) in Brisbane, Australia:
  - 13.3 times more likely to have substantiated CM (95%CI: 4.6,38.3)
  - 13.3 times more likely to enter foster care (95%CI: 5.1,34.3)
  - Most occurred in neonatal period (<30d)
  - McGlade et al, Pediatrics, 2009

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Conradt E, Flannery T, Aschner JL, et al. Prenatal Opioid Exposure: Neurodevelopmental Consequences and Future Research Priorities. Pediatrics. 2019;144(3):e20190128

- Aiming to reduce the incidence ofprenatal opioid exposure in the near future, we highlight the need for large studies with prospectively recruited participants and longitudinal designs, taking into account confounding factors such as socioeconomic status, institutional variations in care, and maternal use of other substances, to independently assess the full impact of NOWS.
- As a more immediate solution, we provide an agenda for future research that leverages the National Institutes of Health Environmental Influences on Child Health Outcomes program to address many of the serious methodologic gaps in the literature, and we answer key questions regarding the short- and long-term neurodevelopmental health of children with prenatal opioid exposure

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CPS ASSESSMENT

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CPS ASSESSMENT ISSUES
Maternal Substance Use

- What was the prenatal care like? Any testing?
- What was the caretaker(s)' capacity to exercise a minimum degree of care to meet the child's needs? Did they prepare for the child?
- What is the caretaker's awareness of the impact of drug use on the child?
- How adequate are the caretaker(s)' parenting skills and responsiveness to the child?

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CPS ASSESSMENT ISSUES
Maternal Substance Use

- Is there a history of abuse or neglect in the family?
- Is there a prior substance use history in the family?
- Who cares for the child?
- What available resources and supports can the family be offered?
- What is the caretaker(s)' current substance use? What is the treatment history?
- What is the condition of the siblings?
- How safe is the home? Is there drug manufacture occurring on the home?

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CPS ASSESSMENT ISSUES
Maternal Substance Use

- What is the child's physical, mental and emotional condition? Special medical needs? Medically fragile?
- What are the results of the medical examination / diagnosis concerning the substance use?
- Has the child been harmed or is in imminent danger of harm?
- Does the child have any special medical or physical needs?
- Is there anyone in the child's environment who can care for the child, especially if there are special medical needs?
- Get specific information about toxicology testing

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CPS ASSESSMENT ISSUES
Drug Testing

- Note whether test result is screening or confirmation
- Note time and date when specimen was taken (not received or analyzed in lab)
- Note specimen source (urine, blood, other)
- Note exact drugs, chemicals and levels found
- Note testing cutoff levels
- Note all drugs (over the counter and prescription) given to child or parent and when
- Call testing lab with questions

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Key References

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