Opioids and Pregnancy: Lifecourse Perspectives

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Behavioral Health System Baltimore
Disclosures

• None
Overview

• Review the history of women and substance use with particular attention to the current opioid epidemic
• Discuss what happens when pregnant women who use drugs get pregnant
• Review the risks associated with substance use and pregnancy and newborn outcomes
• Review standards of care for labor and delivery management of women with substance use disorder
• Explain substance-exposed newborn reporting requirements and process in the state of Maryland
LAUDANUM

EACH FLUID OUNCE CONTAINS

UPPER CASE: SMALL CAPS & SPECIALS

ANT ALCOHOL

45 1/2 GRAINS OPium and 40% ALCOHOL

U.S.P. TINCT. OPI.

McCORMICK & CO., Baltimore, Md., U.S.A.
The current opioid epidemic

- **Iatrogenic**
  - 2012 259,000,000 opioid prescriptions for pain
  - Enough for every adult in US to have month supply

- **Women in the epidemic**
  - Overdose death (2004-2010) increased:
    - 237% for men
    - 400% for women
### Prescription Drug Use and Misuse

<table>
<thead>
<tr>
<th>Past Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription psychotherapeutic drugs</td>
<td>40.9%</td>
<td>47.8%</td>
</tr>
<tr>
<td>“Pain Relievers”</td>
<td>33.9%</td>
<td>38.8%</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>11.3%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Sedatives</td>
<td>5.6%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Stimulants</td>
<td>6.5%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

*NSDUH 2015*
Initiation of Opioid Misuse

• Past Year Initiates 2015 (NSDUH)
  2.1 million = 5800 initiates/day
  - 0.9 million males (0.7%)
  - 1.2 million females (0.9%)
Patterns of Opioid Utilization in Pregnancy in a Large Cohort of Commercial Insurance Beneficiaries in the United States

Brian T. Bateman, M.D., M.Sc., Sonia Hernandez-Diaz, M.D., Dr.P.H., James P. Rathmell, M.D., John D. Seeger, Pharm.D., Dr.P.H., Michael Doherty, M.S., Michael A. Fischer, M.D., M.S., Krista F. Huybrechts, M.S., Ph.D.

Anesthesiology, V 120 • No 5
May 2014

Fig. 2. Temporal trends in opioid dispensing during pregnancy (overall) and by trimester.

Fig. 4. Prevalence of opioid dispensing during pregnancy (overall) by state.
Recent trends in treatment admissions for prescription opioid abuse during pregnancy

Caitlin E. Martin, M.D., M.P.H. a, Nyaradzo Longinaker, M.S. b,*, Mishka Terplan, M.D., M.P.H. c

a Department of obstetrics and gynecology, University of North Carolina hospitals
b Graduate Program in Life Sciences - Epidemiology and Human Genetics Program, University of Maryland, Baltimore
c Department of Epidemiology & Public Health, University of Maryland School of Medicine, Baltimore, MD
2002-2009:
  - Rate of NAS increased

Cost of care 2009
  - NAS = $53,400
  - All other births = $9500

Proportion of NAS paid for from Medicaid
  - 2002 = 69%
  - 2009 = 78%
2014 Maryland Maternal Mortality

- 30% Overdose (opioid)
  - 70% had documented comorbid mental health conditions or intimate partner violence
- 20% Homicide/Suicide
- Overall: 50% Maternal Deaths Behavioral Health Related

Abigail R. Koch, MA, Deborah Rosenberg, PhD, and Stacie E. Geller, PhD, for the Illinois Department of Public Health Maternal Mortality Review Committee Working Group

Fig. 1. Ten-year pregnancy-associated mortality rates for deaths by violence and injury compared with the leading obstetric causes in Illinois, 2002–2011.

Heroin Increasing, Especially among Women

The Changing Face of Heroin Use in the United States: A Retrospective Analysis of the Past 50 Years

Heroin Use Has INCREASED Among Most Demographic Groups

<table>
<thead>
<tr>
<th>SEX</th>
<th>2002-2004*</th>
<th>2011-2013*</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2.4</td>
<td>3.6</td>
<td>50%</td>
</tr>
<tr>
<td>Female</td>
<td>0.8</td>
<td>1.6</td>
<td>100%</td>
</tr>
</tbody>
</table>

| AGE, YEARS |
|------------|------------|------------|----------|
| 12-17      | 1.8        | 1.6        | --       |
| 18-25      | 3.5        | 7.3        | 109%     |
| 26 or older| 1.2        | 1.9        | 58%      |

<table>
<thead>
<tr>
<th>RACE/ETHNICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic white</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANNUAL HOUSEHOLD INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $20,000</td>
</tr>
<tr>
<td>$20,000–$49,999</td>
</tr>
<tr>
<td>$50,000 or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEALTH INSURANCE COVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Medicaid</td>
</tr>
<tr>
<td>Private or other</td>
</tr>
</tbody>
</table>
Case Explores Rights of Fetus Versus Mother

Alicia Beltran, 28, was sent to a drug-treatment center despite insisting she was not using drugs.

By ERIK ECKHOLM
Published: October 23, 2013 | 670 Comments
“No bystander could be more innocent. No damage so helplessly collateral.”
Crack Babies: The Worst Threat Is Mom Herself

By Douglas J. Besharov

LAST WEEK in this city, Greater Southeast Community Hospital released a 7-week-old baby to her homeless, drug-addicted mother even though the child was at severe risk of pulmonary arrest. The hospital’s explanation: “Because [the mother] demanded that the baby be released.”

The hospital provided the mother with an apnea monitor to warn her if the baby stopped breathing while asleep, and trained her in CPR. But on the very first night, the mother went out drinking and left the child at a friend’s house—without the monitor. Within seven hours, the baby was dead. Like Dooney Waters, the 6-year-old living in his mother’s drug den, whose shocking story was reported in The Washington Post last week, this child was all but abandoned by the authorities.
Stigma

• Pregnant women who use drugs endure a particular “stigma”

• Pregnant women are treated differently by the Criminal Justice system

• Stigma – applies to treatment (esp medication assisted treatment)

• More appropriate terms:
  – Discrimination or Prejudice
Why are pregnant women who use drugs discriminated against?

Combination of

• specific state-level policies coupled with the

• (failed) drug war policies
### State Policies on Substance Use during Pregnancy

<table>
<thead>
<tr>
<th>Policy</th>
<th>Number of States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance Use Considered Child Abuse</td>
<td>18</td>
</tr>
<tr>
<td>Substance Use Grounds for Civil Commitment</td>
<td>3</td>
</tr>
<tr>
<td>Targeted Programs for Pregnant Women</td>
<td>19</td>
</tr>
<tr>
<td>Pregnant Women Given Priority Access</td>
<td>12</td>
</tr>
<tr>
<td>Pregnant Women Protected from Discrimination</td>
<td>4</td>
</tr>
</tbody>
</table>

Guttmacher Institute March 2016
Punishing Pregnant Women: Not Best Practice

Maternal-Fetal Unit

Maternal-Infant Dyad

“There is no such thing as a baby ... If you set out to describe a baby, you will find you are describing a baby and someone. A baby cannot exist alone, but is essentially part of a relationship” (D.W. Winnicott 1966)
Punishing Pregnant Women: Not Best Practice

• Discriminatory in how applied
  – Although SUDs affect all, white women more likely to use in pregnancy, black women and poor women far more likely to be prosecuted

• Not grounded in evidence
  – Harms of illicit substances exaggerated; effects of licit substances minimized

• Unintended consequences
  – Policies drive women from PNC, SUD treatment

• Prenatal Care ameliorates adverse effects of substances in women who use drugs
What happens when women who use substances get pregnant?
What happens when women who use substances get pregnant?

<table>
<thead>
<tr>
<th>Substance use by trimester</th>
<th>Not pregnant</th>
<th>Abstinence during pregnancy</th>
<th>Postpartum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>19.0</td>
<td>54.0</td>
<td>92%</td>
</tr>
<tr>
<td>Second</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>4.4</td>
<td></td>
<td>45.4</td>
</tr>
<tr>
<td>Cigarettes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>19.9</td>
<td>24.0</td>
<td>47%</td>
</tr>
<tr>
<td>Second</td>
<td>13.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>12.8</td>
<td></td>
<td>20.1</td>
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<tr>
<td>Illicit drugs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>9.0</td>
<td>11.4</td>
<td>79%</td>
</tr>
<tr>
<td>Second</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>2.4</td>
<td></td>
<td>8.7</td>
</tr>
</tbody>
</table>

NSDUH 2012/13 Past Month
What happens when women who use substances get pregnant?

- Compared to non-pregnant women, women drink less alcohol, smoke fewer cigarettes, and use fewer illicit drugs during pregnancy with exception of pregnant adolescents.
- Use decreases through the course of pregnancy by trimester.
- The greatest reduction is seen earlier.
- 80% resume use postpartum.

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<td>2.4</td>
<td></td>
<td></td>
</tr>
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NSDUH 2012/13 Past Month
All pregnant women are motivated to maximize their health and that of their baby-to-be

- All women are aware of the risks associated with substance use

- All employ a range of strategies to reduce or change intake
  - Decrease or stop use
  - Switch drugs
  - Enter prenatal care
  - Enter SUD treatment
All pregnant women are motivated to maximize their health and that of their baby-to-be.

Those who can’t quit or cut back – have a substance use disorder.

Continued use in pregnancy is pathognomonic for addiction.
- A primary, **chronic** disease of **brain reward, motivation, memory** and **related circuitry**. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. (ASAM)

- A chronic, relapsing disease characterized by **compulsive** drug seeking and use despite harmful consequences as well as neurochemical and molecular changes in the brain. (NIDA)
Addiction: A brain disease whose visible symptoms are behaviors

– A primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. (ASAM)

– A chronic, relapsing disease characterized by compulsive drug seeking and use despite harmful consequences as well as neurochemical and molecular changes in the brain. (NIDA)
Addiction as a chronic disease – in context

• We know how to treat addiction
• We know a little less about how to prevent addiction

• We don’t know how to cure addiction

• Disease severity may change over time – risk of symptom recurrence is always present
• Goal – lifelong management – support recovery
Addiction vs Dependence/Tolerance

- **Physical dependence/tolerance is not addiction**
  - Addiction is a brain disease that affects behaviour
  - Dependence is an expected adaptation of the body to a specific substrate so that in the absence of that substrate a withdrawal syndrome develops
  - Tolerance is pharmacologic principle where reaction to specific concentration of drug is reduced with repeated use
  - Affect different parts of the brain

- **Many medications cause either tolerance or dependence or both** (SSRIs, HTN medication)
  - Everyone taking enough opioid continuously for longer than a week
Women with SUD in Pregnancy
Women with SUD in Pregnancy

Reproductive Health Lifecourse
Women with SUD in Pregnancy

Reproductive Health Lifecourse

Addiction Lifecourse
Women with SUD in Pregnancy

Reproductive Health Lifecourse

Addiction Lifecourse

The Pregnancy Box
Women with SUD in pregnancy

- Mental Health
  - Two thirds co-occurring mental health disorders (Benningfield 2010)
    - Past 30 days: Mood disorder (50%), Anxiety (40%), PTSD (16%)
  - Childhood trauma: 50-90% physical or sexual abuse (Cormier 2000)
  - 60-80% past year intimate partner violence (Engstrom 2012, Tuten 2004)
    - Chronic pain worse in IPV survivors (Wuest 2008)
Women with SUD in Pregnancy

- Reproductive Health
  - Unplanned pregnancy: 80% (Heil 2012)
  - Low rates of contraception (Terplan 2015)
  - Higher rates of HIV
- Other substance use
  - High rates of smoking (>90%)
- Nutritional other medical needs
- Social functioning
  - Inadequate social supports
  - 67% their parents used drugs (Finnegan 1991)
  - Unpredictable parenting models
  - Children – childcare needs
Women with SUD in Pregnancy

- Stigma and Shame
- Prior poor experiences with providers
- Fear of CPS
Pregnant women with SUD have unique set of needs across multiple domains – domains that affect both obstetric health and outcomes and addiction treatment.

Care needs to address those needs.

“Gold Standard” – Integration
- Comprehensive co-located service delivery
- Close collaboration between SUD and PNC provider
Comprehensive prenatal care (PNC) ameliorates adverse outcomes associated with drug use.

### MANAGEMENT OF PREGNANT DRUG-DEPENDENT WOMEN

Loretta P. Finnegan  
*Department of Pediatrics*  
*Thomas Jefferson University*  
*Philadelphia, Pennsylvania 19107*

### LOW BIRTH WEIGHT

<table>
<thead>
<tr>
<th></th>
<th>PNC</th>
<th>No PNC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No drug use</strong></td>
<td>14%</td>
<td>19%</td>
</tr>
<tr>
<td><strong>Drug Use</strong></td>
<td>19%</td>
<td>48%</td>
</tr>
</tbody>
</table>

1978

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**Table 2**  
Obstetrical Complications in 367 Drug-Dependent Women and 215 Controls; Family Center Program, 1969–1976

<table>
<thead>
<tr>
<th>Groups</th>
<th>No. of Patients</th>
<th>Average no. of Prenatal Visits</th>
<th>Obstetrical Complications</th>
<th>LBW Incidence</th>
<th>Pre-eclampsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>65</td>
<td>0</td>
<td>36.9%</td>
<td>47.7%</td>
<td>9.2%</td>
</tr>
<tr>
<td>B</td>
<td>109</td>
<td>1.9</td>
<td>32.1%</td>
<td>35.5%</td>
<td>2.8%</td>
</tr>
<tr>
<td>C</td>
<td>193</td>
<td>8.2</td>
<td>33.7%</td>
<td>19.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>D</td>
<td>93</td>
<td>0</td>
<td>32.3%</td>
<td>19.4%</td>
<td>8.6%</td>
</tr>
<tr>
<td>E</td>
<td>122</td>
<td>9.2</td>
<td>32.0%</td>
<td>13.9%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>

140  
Annals New York Academy of Sciences
Comprehensive Treatment Works

• Kaiser Early Start – Behavioral Health embedded in PNC
  – Birth outcomes among Early Start moms were same as non-drug-using women (Goler 2008)
  – Cost effective – net cost benefit of $6 million (50,000 individuals) (Goler 2012)
  – Early Start expanded to all Kaiser NoCal OB clinics
How do we identify women with substance use in pregnancy?

• Early identification is key
  – Allows for early intervention and treatment that minimizes potential harms to the mother and her pregnancy
  – Maximizes motivation for change during pregnancy

• 2 types of screening
  – Pregnant women in prenatal care for substance use
  – Reproductive-aged women in SUD treatment for pregnancy – pregnancy intention
Screening Pregnant Women for Substance Use

• Universal screening (for licit and illicit substance use) is recommended
  – Alcohol (ACOG 2011)
  – Prescription opioids (ACOG 2012)

• Selective screening based on “risk factors” perpetuates discrimination and misses most women with problematic use
Screening: Instruments

• No single best screening instrument to identify pregnant women with substance problems
• Self-administered or part of the patient interview
• Developed for or validated in pregnant women (partial list)
  – Alcohol: T-ACE (Sokol 1989); TWEAK (Chang 1999)
  – Alcohol and other drugs: DAST and MAST (Kemper 1993); 4P’s Plus (Chasnoff 1999); CRAFFT (Chang 2011) for pregnant adolescents
Screening: Urine toxicology?

- Do not use as sole assessment of substance use/use disorder (ACOG 2012)
  - Short detection window (substance dependent)
  - Might not capture binge or intermittent use
  - Rarely detects alcohol
  - Doesn’t capture prescription opioids (without confirmation testing)
- Useful adjunct primarily for individuals in treatment
- Ethical issues – patient needs to give consent prior to specimen collection
Treatment
Treatment for Opioid Use Disorder in Pregnancy

• Standard of care: Medication Assisted Treatment
  – Methadone or Buprenorphine

• Benefits
  – Stable intrauterine environment (no cyclic withdrawal)
  – Increased maternal weight gain
  – Increased newborn birth weight and gestational age
  – Increase PNC adherence
  – Decrease in illicit drug use - reduction of HIV/HCV acquisition
  – Decrease risk of overdose
  – Other supportive services
Treatment of Opioid Use Disorder in Pregnancy

• “Because it is crucial that pregnant women engage in treatment for their addictions, OTPs should give priority to admitting pregnant patients at any point during pregnancy and providing them with all necessary care, including adequate dosing strategies as well as referrals for prenatal and follow-up postpartum services.”

Federal Guidelines for Opioid Treatment Programs, 2015

• Pregnant women – don’t need to meet DSM criteria for use disorder to receive MAT (TIP 43)
Treatment of Opioid Use Disorder in Pregnancy

- Medication Assisted Treatment (MAT)
  - Methadone
  - Buprenorphine
  - Naltrexone
- Behavioral Therapy

- MAT is supported by
  - ASAM
  - ACOG
  - SAMHSA
  - CDC
  - WHO
Opioid receptor activation
Which Medication?

• Methadone standard of care since 1970s
• Buprenorphine studied since 2002
• What about naltrexone?
Mean Neonatal Morphine Dose, Length of Neonatal Hospital Stay, and Duration of Treatment for Neonatal Abstinence Syndrome.
MOTHER Study: Secondary Outcomes

- Maternal outcomes similar in the 2 study conditions (N=131)
  - Low rates of illicit drug use during pregnancy and at delivery

- Clinically meaningful attrition rate in buprenorphine condition (18% in methadone arm vs 33% in buprenorphine arm)
Methadone vs Buprenorphine in Pregnancy

**Methadone**
- May have better treatment retention
- No risk precipitating withdrawal
- Patients with more severe opioid use disorder

**Buprenorphine**
- Probably less severe NAS
- Reduced risk of overdose during induction
- Reduced risk of overdose if children exposed to medication
Treatment of Opioid Use Disorder in Pregnancy

• How to dose pregnant women?
  – Dose increase earlier to avoid fetal withdrawal
  – Overlap in symptoms between normal pregnancy and withdrawal

• Third trimester
  – Physiological changes (metabolism, circulating volume) may need increase dose
  – Consider split dosing
  – Individualized treatment – do not automatically increase

• Post partum
  – 4-6 weeks for return to pre-pregnancy state
  – Individualize decrease
Medically Supervised Withdrawal

- Addiction is chronic disease – detox is an acute treatment: Clinical mismatch

- Leads to relapse

- Not supported by guidelines (ACOG, ASAM, Federal Guidelines for Opioid Treatment 2015)

- Maternal dose reduction to prevent NAS – does not work (Berghella 2003)
Estimated Number of Infants* Affected by Prenatal Exposure, by Type of Substance and Infant Disorder

- Tobacco: 640,000 (15.9%)
- Alcohol: 340,000 (8.5%)
- Illicit Drugs: 240,000 (5.9%)
- Binge Drinking: 108,000 (2.7%)
- Heavy Drinking: 12,000 (0.3%)
- FAS/ARND/ARBD: 30,000 (0.5-7 per 1,000 births)
- NAS: 22,000 (5.8 per 1,000 births)*

*Approximately 4 million (3,952,841) live births in 2012


Fetal Alcohol Spectrum Disorders

• Terminology
  – Fetal Alcohol Syndrome (FAS): facial dysmorphism, growth and CNS problems
  – Alcohol-Related Neurodevelopment Disorder (ARND): Leading cause of preventable intellectual disability in US
  – Alcohol-Related Birth Defects (ARBD): heart, kidney, bones, hearing, or combination

• Prevalence
  – FAS: 0.2-1.5 per 1000 births
  – FASD: limited data 2-5/100 school children

• Cost
  – FAS: $2 million/child, $4 billion annually in US
Neonatal Abstinence Syndrome

• Expected and treatable consequence of opioid exposure in utero
  – (ACOG 2012) (GAO 2015)
  – Illicit opioids, prescription opioids including MAT

• Without long term negative outcomes
NAS is NOT Addiction

• Newborns can’t be “born addicted”
  – NAS is withdrawal – due to dependence – dependence NOT addiction
  – Addiction is brain disease whose visible symptoms are behaviors – newborn can’t have the behaviors associated with addiction (compulsion, etc)
  – Addiction is chronic disease – chronic illness can’t be present at birth
# Neonatal Abstinence Syndrome

**PEDIATRICS Volume 134, Number 2, August 2014**

## Table 1

Onset, Duration, and Frequency of NAS Caused by Various Substances

<table>
<thead>
<tr>
<th>Drug</th>
<th>Onset, h</th>
<th>Frequency, %</th>
<th>Duration, d</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opioids</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heroin</td>
<td>24–48</td>
<td>40–80&lt;sup&gt;27&lt;/sup&gt;</td>
<td>8–10</td>
</tr>
<tr>
<td>Methadone</td>
<td>48–72</td>
<td>13–94&lt;sup&gt;37&lt;/sup&gt;</td>
<td>Up to 30 or more</td>
</tr>
<tr>
<td>Buprenorphine</td>
<td>36–60</td>
<td>22–67&lt;sup&gt;46,48&lt;/sup&gt;</td>
<td>Up to 28 or more</td>
</tr>
<tr>
<td>Prescription opioid medications</td>
<td>36–72</td>
<td>5–20&lt;sup&gt;56,60&lt;/sup&gt;</td>
<td>10–30</td>
</tr>
<tr>
<td><strong>Nonopioids</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSRIs</td>
<td>24–48</td>
<td>20–30&lt;sup&gt;64&lt;/sup&gt;</td>
<td>2–6</td>
</tr>
<tr>
<td>TCAs</td>
<td>24–48</td>
<td>20–50&lt;sup&gt;64&lt;/sup&gt;</td>
<td>2–6</td>
</tr>
<tr>
<td>Methamphetamines</td>
<td>24</td>
<td>2–49&lt;sup&gt;101&lt;/sup&gt;</td>
<td>7–10</td>
</tr>
<tr>
<td>Inhalants</td>
<td>24–48</td>
<td>48&lt;sup&gt;70&lt;/sup&gt;</td>
<td>2–7</td>
</tr>
</tbody>
</table>
NAS: Other Factors Contributing to Severity

• Structural
  – The NAS assessment
  – Medication initiation
  – Weaning protocols
  – NICU or rooming-in

• Postpartum
  – Breastfeeding
  – Skin-to-skin contact

• Non-modifiable - genetics
  – OPRM1 – opioid receptor (Wachman 2014)
  – CYP – placental transfer

• Other Substances
  – Benzodiazepines
  – SSRIs
  – Cigarette smoking

Neonatal Abstinence Syndrome and Associated Health Care Expenditures
United States, 2000-2009

Context: Neonatal abstinence syndrome (NAS) is a postnatal drug withdrawal syndrome primarily caused by maternal opiate use. No national estimates are available for the incidence of maternal opiate use at the time of delivery or NAS.

Objectives: To determine the national incidence of NAS and antepartum maternal opiate use and to characterize trends in national health care expenditures associated with NAS between 2000 and 2009.

Design, Setting, and Patients: A retrospective, serial, cross-sectional analysis of a nationally representative sample of newborns with NAS, the Kids' Inpatient Database (KID).

Table 3. Mean Hospital Charges and Length of Stay for Neonatal Abstinence Syndrome vs All Other US Births

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Length of stay, d</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Unweighted sample, No.</td>
<td>2920</td>
<td>3761</td>
<td>5200</td>
<td>9674</td>
<td></td>
</tr>
<tr>
<td>Neonatal Abstinence Syndrome</td>
<td>15.8 (14.2-17.3)</td>
<td>15.9 (14.5-17.3)</td>
<td>15.3 (14.6-16.0)</td>
<td>16.4 (15.8-17.1)</td>
<td>.06</td>
</tr>
<tr>
<td>All Other US Births</td>
<td>3.1 (3.0-3.1)</td>
<td>3.2 (3.1-3.2)</td>
<td>3.2 (3.2-3.3)</td>
<td>3.3 (3.3-3.4)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Hospital charges, 2009 US $</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unweighted sample, No.</td>
<td>784191</td>
<td>890582</td>
<td>1000203</td>
<td>1113123</td>
<td></td>
</tr>
<tr>
<td>Neonatal Abstinence Syndrome</td>
<td>6600 (5800-7300)</td>
<td>7300 (6900-7600)</td>
<td>8200 (7800-8600)</td>
<td>9500 (9000-9900)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>All Other US Births</td>
<td>6600 (5800-7300)</td>
<td>7300 (6900-7600)</td>
<td>8200 (7800-8600)</td>
<td>9500 (9000-9900)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Table 4. Proportions of US Hospital Charges for Neonatal Abstinence Syndrome by Payer

<table>
<thead>
<tr>
<th>Year</th>
<th>Unweighted Sample, No.</th>
<th>Medicaid</th>
<th>Private Payer</th>
<th>Self-pay</th>
<th>Other Payer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2920</td>
<td>68.7 (63.3-76.7)</td>
<td>18.2 (14.6-22.5)</td>
<td>8.7 (5.6-13.3)</td>
<td>4.4 (2.0-9.3)</td>
</tr>
<tr>
<td>2003</td>
<td>3761</td>
<td>69.9 (65.9-73.6)</td>
<td>19.8 (16.9-23.1)</td>
<td>6.5 (4.5-9.3)</td>
<td>3.8 (1.6-8.7)</td>
</tr>
<tr>
<td>2006</td>
<td>5200</td>
<td>73.7 (70.4-76.7)</td>
<td>19.0 (16.4-22.0)</td>
<td>5.5 (4.4-6.9)</td>
<td>1.9 (1.3-2.8)</td>
</tr>
<tr>
<td>2009</td>
<td>9674</td>
<td>77.6 (74.4-80.4)</td>
<td>17.6 (15.1-20.4)</td>
<td>2.9 (2.4-3.4)</td>
<td>2.0 (1.4-2.9)</td>
</tr>
</tbody>
</table>

*Percentages may not sum to 100 because of rounding.
Cost of care = Severity of Disease?

• Cost reflects how and where we care for infants (NICU) – not where they have to be cared for

• Rooming-in infants (Abrahams Can Fam Physician 2007)
  – Less likely to be treated for NAS (RR=0.47 [0.24-0.93])
  – Fewer days treated (5.9 vs 18.6 p=0.003)
  – Days in hospital (11.8 vs 25.9, p<0.001)
  – Discharged with mother (RR=1.52 [1.01-2.29])
The 4th Trimester - Postpartum

- Critical Period
  - Newborn care, breastfeeding, maternal/infant bonding
  - Mood changes, sleep disturbances, physiologic changes
  - Cultural norms, “the ideal mother” in conflict with what it is actually like to have a newborn

- Neglected Period
  - Care shifts away from frequent contact with PNC provider – to pediatrician
  - Care less “medical” (for mom) and shifts to other agencies (WIC)
  - Insurance and welfare realignment
    - SUD treatment provider(s) – care is constant

- Gaps in care – addressed through public health interventions – home visiting etc
Putting it all together

- All pregnant women manifest motivation to maximize their health during pregnancy
- Most women stop or decrease use in pregnancy
- Those that can’t have a SUD
- Engagement in care improves outcomes
- However, pregnant women with SUDs have unique set of needs and experience discrimination
- Therefore, care needs to be compassionate and non-judgmental, comprehensive and coordinated with PNC provider
- Preventing substance exposed pregnancies means decreasing unplanned pregnancies, increasing access to reproductive health services, specifically contraception
Thank You

- Mishka.Terplan@bhsbaltimore.org
Breastfeeding and substance use

- Breastfeeding encouraged if:
  - Engaged in treatment (including MAT – regardless of dose) and plan to continue in treatment

- Breastfeeding contraindicated:
  - Active use, not engaged in treatment, no prenatal care

- Cannabis – controversial – AAP recommends not breastfeeding

- Alcohol (wait 90-120 minutes after drinking before breastfeeding – or pump and discard)

- Breastfeeding conversation – opportunity to support smoking cessation