

# Opioid use in pregnancy and Neonatal Opioid Withdrawal Syndrome (NOWS)

Morissa Ladinsky, MD

Assoc. Professor of Pediatrics

Division of General Pediatrics and Adolescent Medicine

UAB



**UAB** MEDICINE

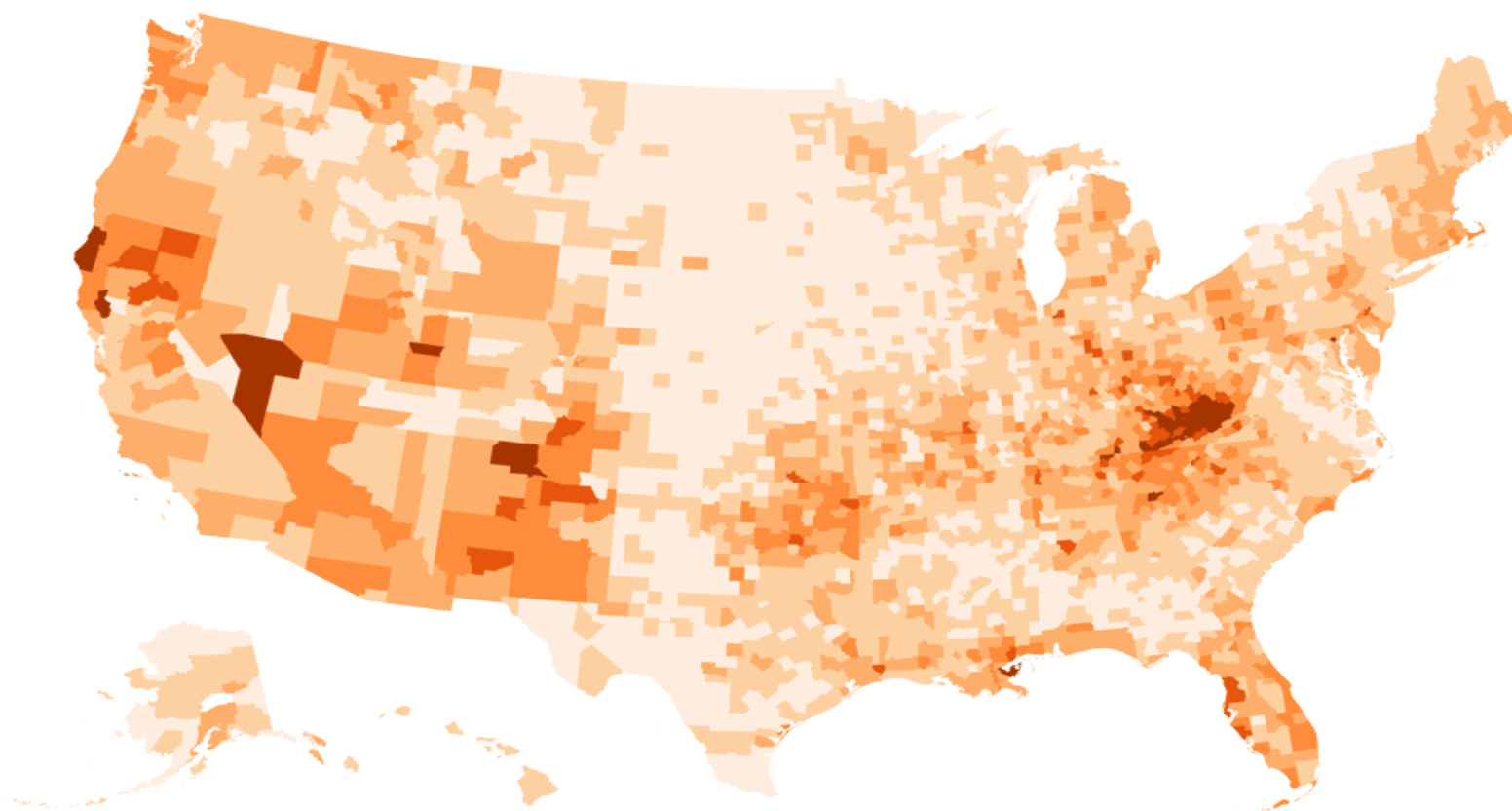
DEPARTMENT OF PEDIATRICS



Children's  
of Alabama

Death rate per 100,000

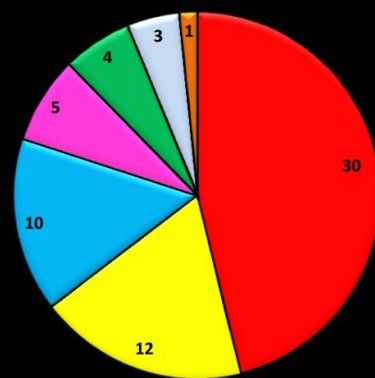
0-4   4.1-8   8.1-12   12.1-16   16.1-20   20+



**2002** | US: 23,518 deaths | 8.2 per 100,000

# US/Alabama 2019 Drug Threat Assessment

2018 GC HIDTA Drug Survey - LAW ENFORCEMENT  
GREATEST DRUG THREAT



■ METHAMPHETAMINE  
■ HEROIN  
■ FENTANYL & OTHER OPIOIDS  
■ CONTROLLED PRESCRIPTION DRUGS



Health » Food | Fitness | Wellness | Parenting | Vital Signs

Live TV • International Edition

## Rate of women addicted to opioids during pregnancy quadrupled in 15 years, CDC says

By Susan Scutti, CNN

🕒 Updated 1706 GMT (0106 HKT) August 9, 2018



# Objectives

1. Understand the **magnitude, medicine and scope** of **neonatal abstinence syndrome**.
2. Learn **concrete, data driven public health measures** and **best practice approaches** to the immense challenge of care for opioid exposed infants.
3. **View current and future trends** in comprehensive management of **NOWS**.

**THIS IS A  
BRAIN ON  
DRUGS.**



# Dopamine

- Central power driver. Essence of being human
  - Memory (if DA is present, we remember it).
  - Regulates how we perceive pleasure.
  - Sleep and wakefulness
  - Cognition (DA in frontal lobe)
  - Pleasure and drive to seek it.
- Food
  - Sex
  - Winning a competition
  
  - Cocaine
  - Meth
  - Opioids
  - Heroin



# Methamphetamine in pregnancy

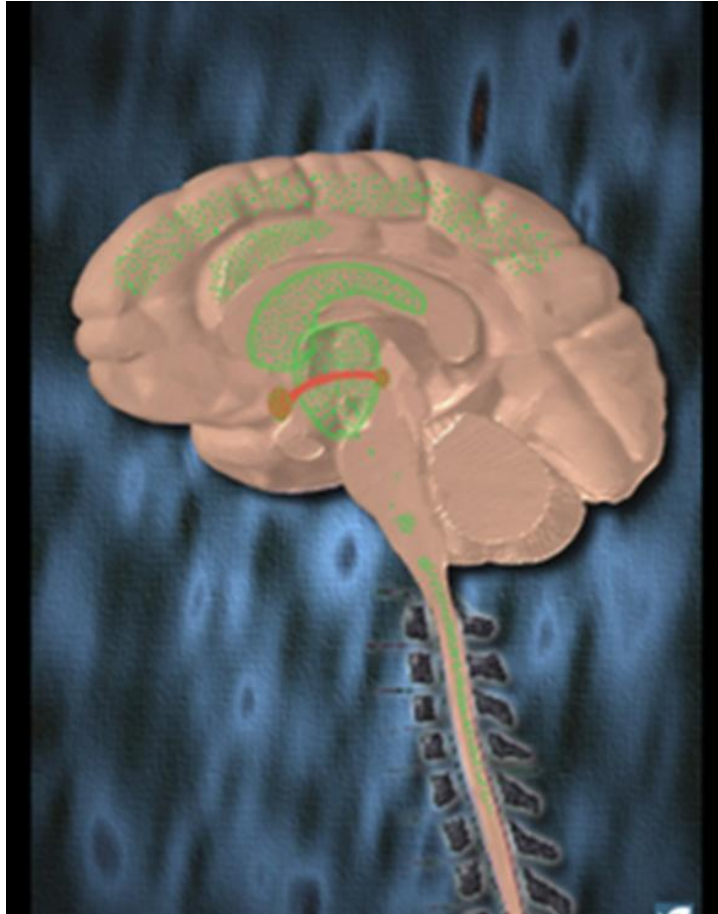


- Low birthweight
- Shorter gestational age
- Maternal HTN/pre-e
- Abruptio (10%)
- Rare reports of ICH
- Rare and brief withdrawal
  
- Longer term learning disability
- ADHD

***“STOPPING MA AT ANY TIME DURING PREGNANCY IMPROVES OUTCOMES”***

Negative outcomes on the developing child are due to the meth’s effect on mother’s systems.

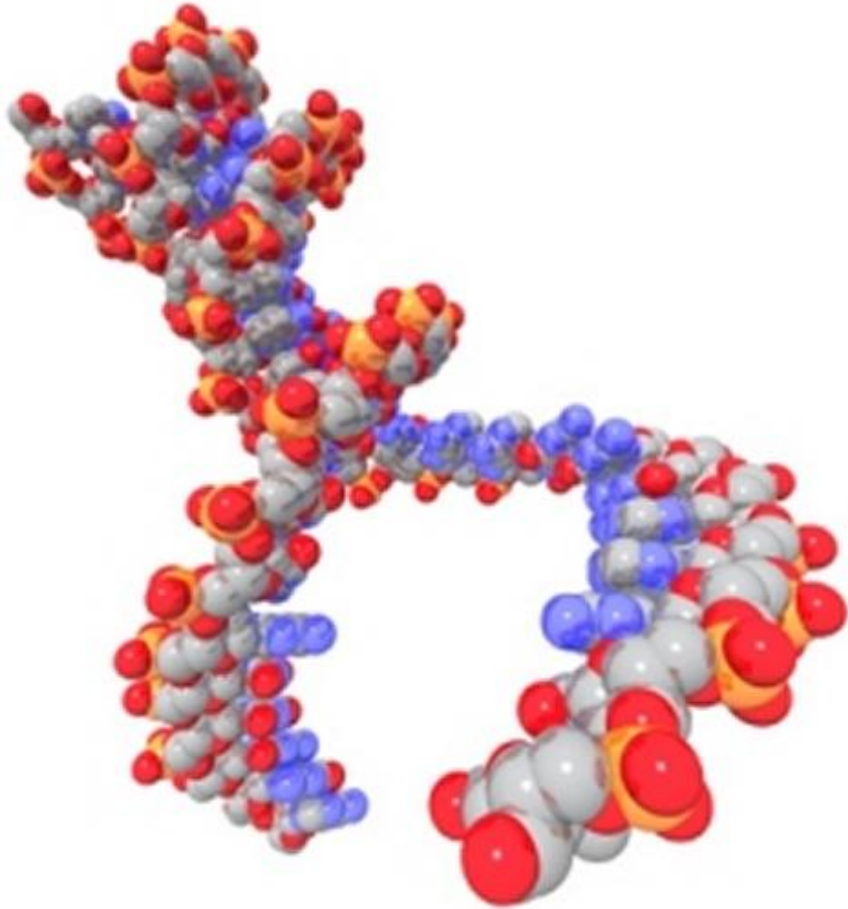
# Opioids work via specific RECEPTORS



- Brainstem: Basic life sustaining functions (sleep, breathing, HR)
- Limbic System: Emotional center (pleasure, mood, attitude)
- Cerebral Cortex
- Autonomic neurons (GI, skin, muscle)



# Why do only some progress to addiction?



- Over 50% of one's propensity to addiction is under the control of our genes.
- GENETICS +
- PAST AND PRESENT ENVIRONMENT +
- EXPOSURE TO THE DRUG

# ACE's

- Alcoholism and alcohol abuse
- Chronic obstructive pulmonary disease (COPD)
- Depression
- Fetal death
- Health-related quality of life
- Illicit drug use
- Ischemic heart disease (IHD)
- Liver disease
- Risk for intimate partner violence
- Multiple sexual partners
- Sexually transmitted diseases (STDs)
- Smoking
- Suicide attempts
- Unintended pregnancies
- Early initiation of smoking
- Early initiation of sexual activity
- Adolescent pregnancy

Maladaptive neural connections in the developing brain.

Adverse effect of early toxic stress on brain development.



# Opioid/heroin dependence in pregnancy

- Developing baby experiences daily highs, lows and withdrawal.
- Withdrawal for mom is passed to developing infant.
- Premature delivery, fetal demise.
- **“Pregnant women who are physically dependent on opioids should receive treatment using methadone or buprenorphine monoproduct *rather than withdrawal management or abstinence.*”**
- NIDA, ACOG, NICHD, HHS consensus 7/2016



# Neonatal Opioid Withdrawal Syndrome

- The clinical findings associated with **opioid** withdrawal has been termed the neonatal opioid withdrawal syndrome (NOWS).
- Nearly all exposed infants will display some symptoms, but only a subset require treatment.

Opioid receptors concentrated in CNS and GI tract.

NAS affects baby's ability to be alert, sleep, eat, communicate cues

**1 every 15 minutes**



# CLINICAL FEATURES

Neurological Excitability	Autonomic Instability	GI Dysfunction
<ul style="list-style-type: none"><li>• Hyperirritability</li><li>• High-pitched inconsolable crying</li><li>• Agitation/Restlessness → Exoriations</li><li>• Difficulty sleeping</li><li>• Tremors</li><li>• Exaggerated Moro reflex</li><li>• Hypertonia</li><li>• Excessive motor activity</li><li>• Myoclonic jerks</li><li>• Uncontrolled, constant sucking</li><li>• Seizures (2-11%)</li></ul>	<ul style="list-style-type: none"><li>• Apnea</li><li>• Bradycardia</li><li>• Tachypnea</li><li>• Nasal flaring</li><li>• Nasal stuffiness</li><li>• Temperature instability</li><li>• Sweating</li><li>• Sneezing</li><li>• Mottling</li><li>• Yawning</li></ul>	<ul style="list-style-type: none"><li>• Diarrhea → electrolyte disturbances, dehydration, perianal skin excoriation</li><li>• Hyperphagia (may require up to 150 kcal/kg/d)</li><li>• Regurgitation</li><li>• Vomiting</li><li>• Poor feeding</li><li>• Poor weight gain/FTT</li></ul>

# Clinical Timeline



SUBSTANCE	ONSET (hours)	DURATION (days)
Heroin	24-48	8-10
Methadone	48-72	Up to 30+
Buprenorphine	36-60	Up to 28
Prescription opioids	36-72	10-30
Polypharmacy	??	??
Fentanyl	??	??



# Discharge at 48 hrs???

- AAP (2014 and 2017)
- WHO (2014)
- Known fetal exposure: **4-7 days!**
- **1 in 5** has onset after **48 hrs**

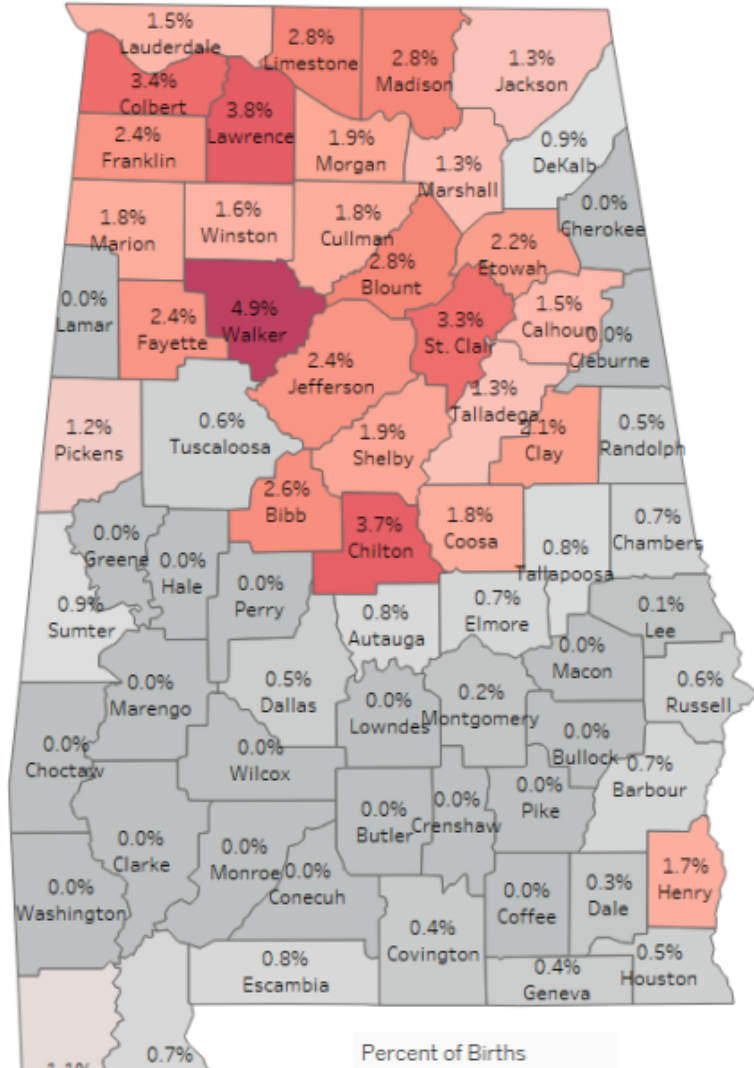


- Withdrawal at home...
  - Poor feeding
  - Vomiting and diarrhea
  - Extreme irritability
  - Sleep challenges
  - DEHYDRATION
  - SEIZURES
  - RISK FOR CHILD ABUSE

## Neonatal Abstinence Syndrome (NAS)

**NAS** Drug withdrawal syndrome in newborns caused primarily by *in utero* exposure to opioids. [CDC]

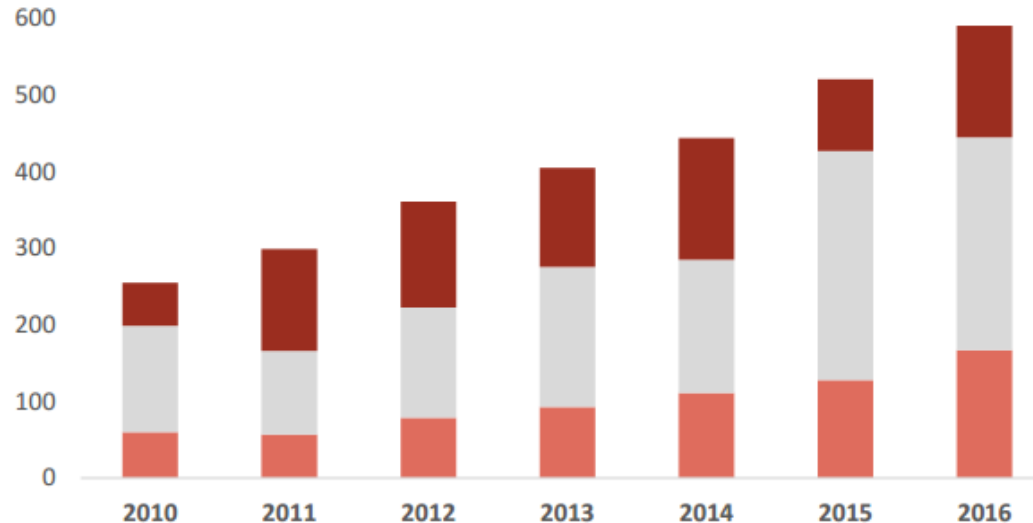
**NAS Infants by County (2016)**



**Medicaid Infants with NAS by Race  
In 2016 per 1,000 Births**

<b>26.9</b>	<b>5.7</b>	<b>2.7</b>	<b>15.7</b>
<b>White</b>	<b>Black</b>	<b>Hispanic</b>	<b>Other</b>

**Infants Diagnosed with NAS  
Mothers' Medicaid Opioids Claims Status**





# Medication Assisted Treatment (MAT)

	Buprenorphine (Subutex)	Buprenorphine/Naloxone (Suboxone)	Methadone
MECHANISM	Binds partially to the same opioid receptors with a longer dissociation period.	Trace doses of opioid antagonist.	Synthetic opioid agonist. Occupies same receptors but activates them very slowly.
IMPACT	No high. No withdrawal No craving. Clear mind.	If heroin or opioid used also, instant withdrawal symptoms.	No high, no withdrawal if used in correct doses.

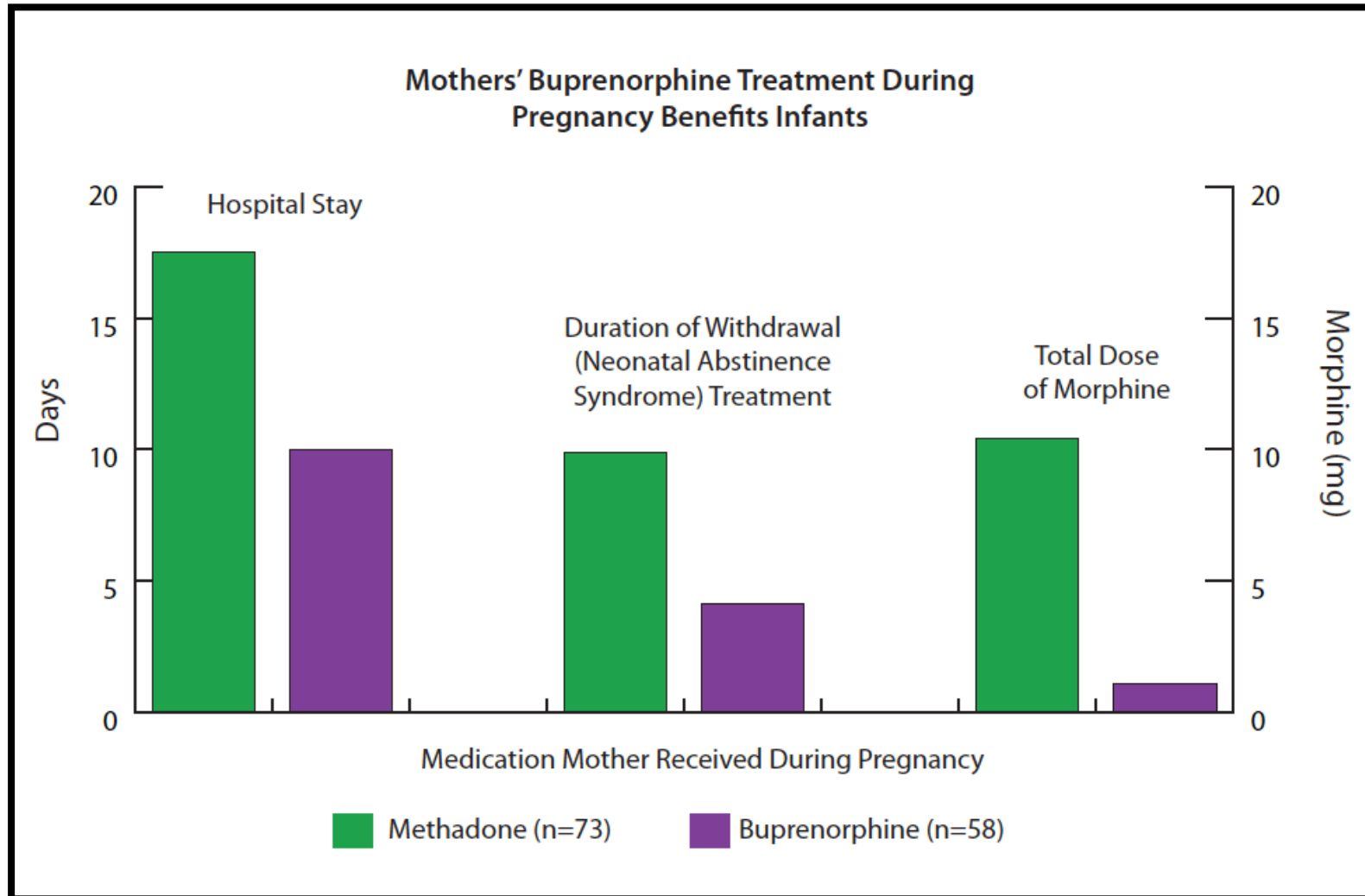
# MAT Myths, New tools

- *MEDICATION IS NOT THE TRADING OF ONE ADDICTION FOR ANOTHER*
- "People ask me all the time, 'well, aren't they just substituting one drug for another?' The answer is no. These are evidence-based treatments and they work,"

[Patrice A. Harris](#),

Chair AMA Opioid Task Force

# MAT changes the outcome





**BREASTFEEDING**

It Rocks!

# Breastfeeding and Substance Use

- AAP committee recommends all mothers in methadone/buprenorphine treatment be allowed to breast-feed regardless of dose.
- Data suggests a **protective effect on the rate of NOWS.**
- HCV and HBV **not** contraindication for breast feeding
- HIV contraindication in developed countries

*AAP: Committee on Drug. Pediatrics 2001 and 2013*



# Rooming in

## ROOMING-IN MAY BE ASSOCIATED WITH EVEN GREATER SAVINGS

### ○ Decreased need for pharm Rx:

55% → **25%**: Abrahams *et al. Can Fam Physician.* 2007.

45% → **11%**: Saiki *et al. Eur J Pediatr.* 2010.

83% → **14%**: McKnight *et al. Am J Perinatol.* 2016.

46% → **27%**: Holmes *et al. Pediatrics.* 2016.

### ○ Decreased LOT by:

**13 days**: Abrahams *et al. Can Fam Physician.* 2007.

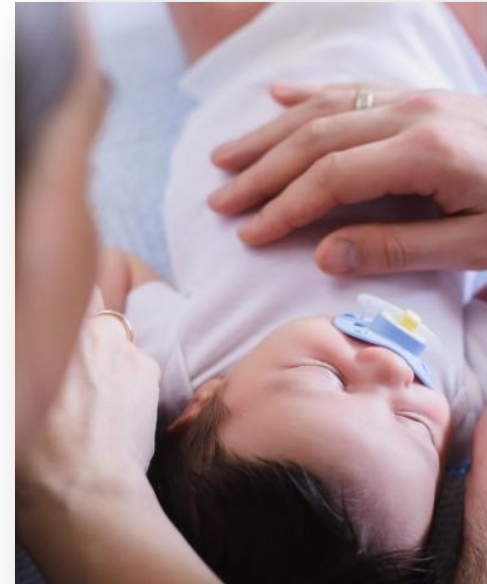
>5 days: Saiki *et al. Eur J Pediatr.* 2010.

### ○ Decreased LOS by:

4-5 days: Saiki *et al. Eur J Pediatr.* 2010. Holmes *et al. Pediatrics.* 2016.

**12 days**: Abrahams *et al. Can Fam Physician.* 2007.

**19 days**: McKnight *et al. Am J Perinatol.* 2016.



## Benefits of the Approach in this Study Site

- Length of hospital stay for infants  
**22.4 to 5.9 days**
- Infants receiving pharmacological treatment  
**98% to 14%**
  - Hospital costs per family  
**\$44,824 to \$10,289**

No infants were readmitted for treatment of NAS and no adverse events were reported

Grossman, et al, 2017

# Evolution of Federal Protections and \$\$\$\$\$



**1974**

Child Abuse Prevention and Treatment Act (CAPTA)



**2003**

The Keeping Children and Families Safe Act



**2010**

The CAPTA Reauthorization Act



**2016**

Comprehensive Addiction and Recovery Act (CARA)

Primary Changes  
in **CAPTA**  
Related to Infants  
with Prenatal  
Substance  
Exposure

Important to note that Tribes don't participate in the CAPTA grant thus do not make assurances regarding programs and policies

# A COLLABORATIVE, **NON-PUNITIVE** APPROACH

## Domains that might be in a Plan of Safe Care

- Primary, Obstetric and Gynecological Care
- Substance Use and Mental Health Disorder Prevention and Treatment
- Parenting and Family Support
- Infant Health and Safety
- Infant and Child Development

- Women with SUD are identified during pregnancy.
- Engaged into prenatal care, medical care, substance use treatment, and other needed services.
- Plans address the needs of **BOTH INFANTS AND PARENTS/CAREGIVERS.**
- **NOWHERE IS REMOVAL FROM HOME A FIRST OR CRITICAL STEP.**



# Longitudinal effects of prenatal exposure

- Mixed results from retrospective cohort studies.
- Heterogeneity of prenatal exposure and environmental risks.
- AAP 2013 “no consensus on the effects...on cognitive abilities”
- Norwegian prospective study
- Youth age 17-22 prenatally exposed to
  - heroin alone
  - polypharmacy
  - unexposed
- Decreased cognitive ability
- Minimal executive function decline
- Envtl post natal factors + factors before birth

# Comprehensive, pro-active care

- Early Intervention
- Close wraparound care
- Continued recovery
- Family planning



# Felony Chemical Endangerment

*AL Code Section 26-15-3.2*

- Variable testing
- Variable enforcement
- Variable interpretation
- **VARIABLE FEAR**
  - Avoidance of prenatal care
  - Missed opportunities
  - Missed cases of withdrawal



# Child endangerment.



# Uniform clear transparent dictate

- Accessing prenatal care will not bring incarceration.
- Disclosure of opioid use will not bring incarceration.
- Adherence to CARA will involve DHR to facilitate access to comprehensive care. Not incarceration or separation.



Better tomorrows for our kids and those who love them.

