

# Substance abuse disorder, pregnancy, and Fort Wayne's children

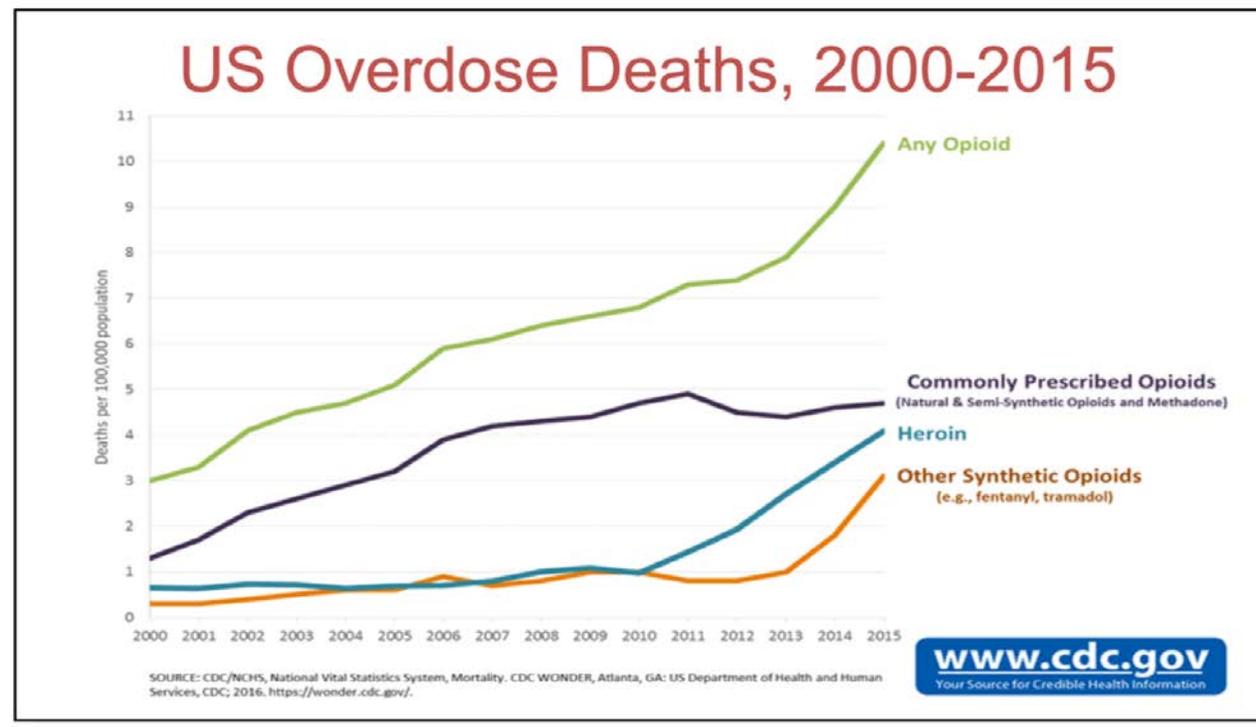
Northeast Indiana Patient Safety Coalition

# Definitions:

- ▶ Substance Use Disorder (SUD): A condition involving the intoxication, withdrawal, abuse or dependence upon a substance with defined abuse or dependence potential, including alcohol.
- ▶ Neonatal Abstinence Syndrome (NAS): A clinically diagnosed syndrome experienced by drug-exposed newborns after birth.

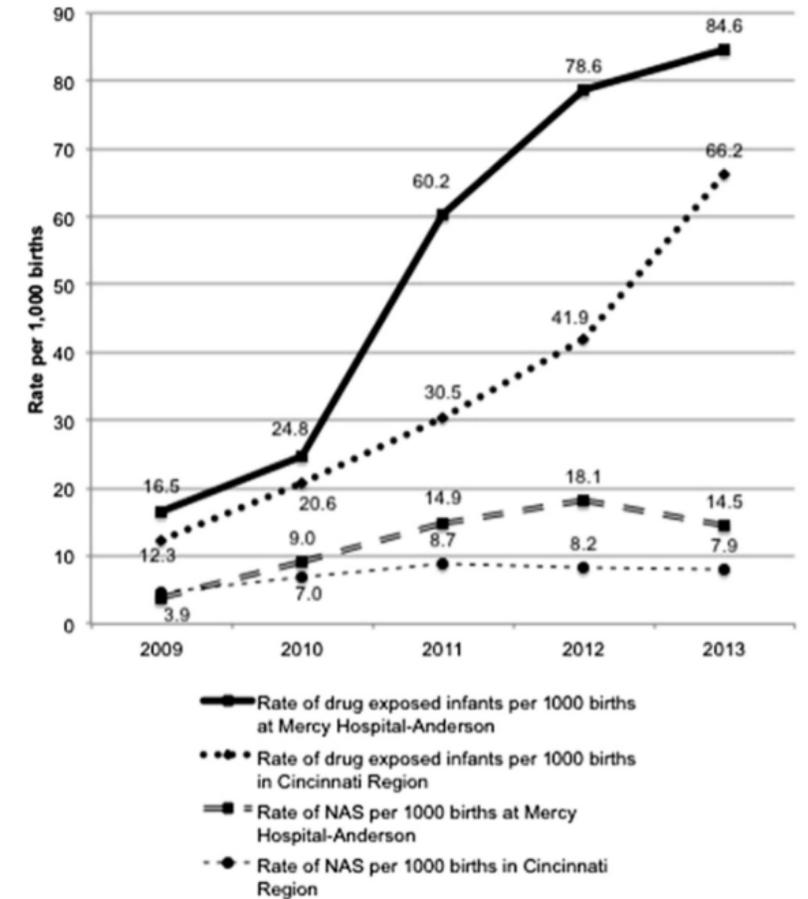
# Substance abuse disorder

- ▶ More deaths than car accidents (91 deaths a day nationwide), including 68 area deaths in 2016 due to opioids
- ▶ A growing problem



# But in pregnancy??

- Drug use among women of child bearing age decreased from early 80's to early 90's
  - ▶ 15% down to 8%
- US 1999 National Household Survey on Drug Abuse
  - ▶ 3.4% of pregnant women were current users of illicit drugs during the prior month
  - ▶ 1.4% had used heroin
  - ▶ 0.1% had recent use of heroin
- 2003: National Survey on Drug Use - 4.2%
- And.... Getting worse



**Figure.** Rates of NAS and drug-exposed infants per 1000 births obtained from *International Classification of Diseases, Ninth Revision* codes 760.70, 760.71, 760.72, 760.73, 760.75, 760.77, and 779.5 at Mercy Anderson Hospital and the Cincinnati region (unpublished local data, Perinatal Institute, Cincinnati Children's Hospital Medical Center, November 2013).

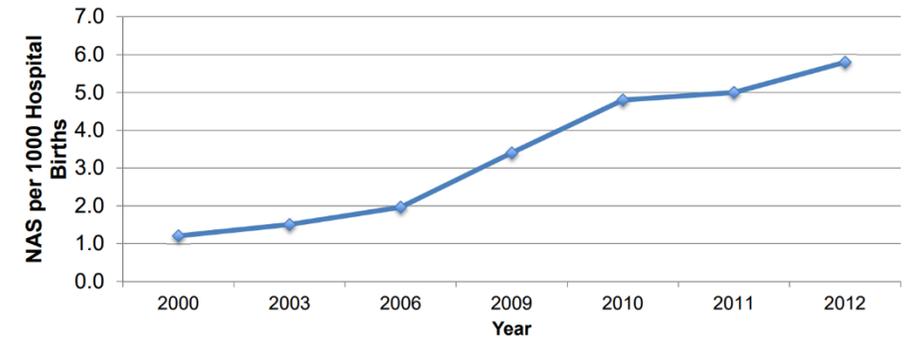
# Neonatal Abstinence Syndrome

- ▶ Not surprisingly... also a growing problem
- ▶ ... and expensive
- ▶ ... infant harms?
  - ▶ “effects on developing brain are subtle but long lasting, include alterations to neuronal apoptosis, dendritic morphogenesis, and neurotransmitter homeostasis.”
  - ▶ Poor school performance in 3<sup>rd</sup> graders <sub>1</sub>
  - ▶ Higher risk of social, psychological, and health problems even into teenage years<sub>2</sub>

1. Oei, J Neonatal Abstinence Syndrome and High School Performance [Pediatrics February 2017, VOLUME 139 / ISSUE 2](#)

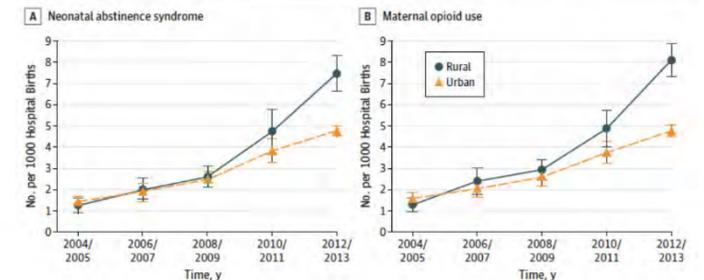
2. Uebel, H Reasons for Rehospitalization in Children Who Had Neonatal Abstinence Syndrome, [Pediatrics October 2015, VOLUME 136 / ISSUE 4](#)

### Incidence of NAS in the US, 2000-2012



## U.S. NAS Statistics

Figure. Changes in Opioid-Related Diagnoses Among Infants and Mothers by Urban/Rural Status



### Cost (charges)

- \$39,400 → \$53,400 → \$93,400; 80% Medicaid

Patrick SW et al. JAMA.2012.3951.



Patrick SW, Davis MM, Lehman CU, Cooper WO. *J Perinatol.* 2015 Apr 30  
Villapiano NLG, Winkelman TNA, Kozhimanil, et al. *JAMA Peds* 2016;Dec 12.

# How are we doing?

- ▶ ?
- ▶ **Universal Maternal Drug Testing in Cincinnati Region** (Atrium Medical Center, The Christ Hospital, Dearborn County Hospital, Highland District Hospital, Margaret Mary Hospital, McCullough-Hyde Memorial Hospital St. Elizabeth Hospital, UC Health's UC Medical Center, West Chester Hospital, TriHealth's Bethesda North Hospital, Good Samaritan Hospital, Mercy Health Partners' Anderson Hospital, Fairfield Hospital, West Hospital, Kettering Health Network's Fort Hamilton, Kettering Medical Center, Southview Medical Center, Soin Medical Center)
  - ▶ 5.4% of all mothers had a positive drug test on admission.
  - ▶ 3.2% of the mothers were positive for opiates
  - ▶ 20% of the mothers with a positive urine drug test for opiates had a negative risk based screen
  - ▶ 7 of the 19 (37%) infants “discovered” with universal testing required additional care for signs and symptoms of NAS
  - ▶ 23% of the mother’s with a positive drug test for any drug had a negative risk based screen
- ▶ Being able to start non-pharmacological bundle earlier, may lead to a decrease in percentage of infants requiring medications for NAS

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**Universal Maternal Drug Testing in a High-Prevalence Region of Prescription Opiate Abuse**

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**Objective** To evaluate the efficacy of a universal maternal drug testing protocol for all mothers in a community hospital setting that experienced a 3-fold increase in neonatal abstinence syndrome (NAS) over the previous 5 years.

**Study design** We conducted a retrospective cohort study between May 2012 and November 2013 after the implementation of universal maternal urine drug testing. All subjects with positive urine tests were reviewed to identify a history or suspicion of drug use, insufficient prenatal care, placental abruption, sexually transmitted disease, or admission from a justice center, which would have prompted urine testing using our previous risk-based screening guidelines. We also reviewed the records of infants born to mothers with a positive toxicology for opioids to determine whether admission to the special care nursery was required.

**Results** Out of the 2956 maternal specimens, 159 (5.4%) positive results were recorded. Of these, 96 were positive for opioids, representing 3.2% of all maternity admissions. Nineteen of the 96 (20%) opioid-positive urine tests were recorded in mothers without screening risk factors. Seven of these 19 infants (37%) required admission to the special care nursery for worsening signs of NAS, and 1 of these 7 required pharmacologic treatment.

**Conclusion** Universal maternal drug testing improves the identification of infants at risk for the development of NAS. Traditional screening methods underestimate in utero opioid exposure. (*J Pediatr* 2015;166:582-6).

See editorial, p 522

**W**idespread abuse of new, powerful prescription narcotics now accounts for a major source of opioid addiction. In the US, there was an almost 3-fold increase in the incidence of neonatal abstinence syndrome (NAS) between 2000 and 2009.<sup>1</sup> In Ohio, a 6-fold increase in hospitalization for NAS was recorded between 2004 and 2011.<sup>2</sup> The incidence of in utero drug exposure has increased 6-fold over the past 5 years in the Cincinnati region (Figure). Approximately 60% of infants exposed to methadone develop NAS, presenting with signs of narcotic withdrawal after delivery.<sup>3</sup> The number of infants who develop NAS after prescription drug exposure has not been widely examined, but prevalence appears to be lower than that of NAS after methadone exposure.<sup>4</sup> The manifestations of NAS include extreme irritability, feeding intolerance and diarrhea, abnormalities of tone, and seizures.<sup>5</sup> Newborns with NAS require extended hospitalization and present social and economic burdens for families, healthcare providers, social service institutions, and government agencies.<sup>1,2,6</sup>

Prompt diagnosis of NAS allows for timely initiation of treatments, including nonpharmacologic interventions such as swaddling and, in more severe cases, administration of narcotics, which are weaned over a period of days to mitigate signs of withdrawal, optimize feeding, and reduce the possibility of seizure activity.<sup>7</sup> The consequences of a missed diagnosis and lack of treatment are significant. Affected newborns may fail to thrive, develop seizures, and experience respiratory compromise. Their extreme irritability also may prove challenging for caregivers, increasing the susceptibility to abuse and neglect.<sup>8</sup>

Signs of NAS may not appear until 72 hours after birth and can vary in intensity,<sup>9</sup> not consistently related to the extent of maternal opioid exposure.<sup>3</sup> A maternal history of narcotic use during pregnancy can alert providers to the risk of NAS in a newborn, but accurate information is inconsistently obtained at the time of delivery. Risk-based screening criteria are often applied to trigger maternal testing for opioid exposure<sup>10</sup>; however, this strategy might not be sufficiently robust to identify all newborns at risk for NAS, especially before discharge from the newborn nursery,<sup>11</sup> given the underreporting of maternal drug use.<sup>12</sup>

Considering the importance of prompt, accurate NAS diagnosis, we studied the efficacy of a universal testing protocol for all mothers delivering at a community hospital that has experienced a 3-fold increase in the prevalence of

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# Everyone????

- ▶ ““With a project of this scale, we quickly realized that in order to reduce the incidence (of newborns being exposed to drug use in the womb), universal testing would be one of the methods to employ and that would take all of our hospitals coming together and reaching consensus. It was sort of an all-or-nothing (situation), so it was a united front from the community's perspective”
- ▶ “We approached it universally, meaning we all said, 'We're going to do this together,' ”

# Universal testing... now what?

## ➤ Infant

- Improved capability catch all infants at risk, to monitor, diagnose, and treat newborns exposed to in-utero substances of abuse
- Facilitate involvement of the department of child services to ensure safety, resources as part of coordinated 'safety plan'
- Facilitate involvement with home visiting program
- Coordinate up-to-date standards of care with follow-up pediatrician, developmental pediatrician, and DCS



# Universal Testing... now what?

## Advantages of pre-natal testing:

- ▶ *“Identifying and reporting newborns exposed to maternal substance abuse during pregnancy can be associated with beneficial changes in the environment of the infants and successful rehabilitation of many mothers. The use of judicial supervision, rehabilitative and supportive services, and long-term involvement of social services without criminal prosecution are key to successful outcome.”*<sup>1</sup>
- ▶ Timely referral to behavioral and medicated assisted treatment
- ▶ Nursery expectations

1. Perinatal substance abuse: the impact of reporting infants to child protective services. 1. [Pediatrics](#). 1997 Nov;100(5):E1.

# Rafting 101:

