

# “PIC TALKS”

February 22, 2017 Seminar

## “Neonatal Abstinence Syndrome”

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Prenatal & Infant Care Network



# Neonatal Abstinence Syndrome

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February 22<sup>nd</sup>, 2017

# Objectives

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- ◉ Describe signs and symptoms of NAS
- ◉ Drugs resulting in NAS
- ◉ Identify scoring systems for NAS
- ◉ Discuss treatment strategies
- ◉ Need for prenatal counseling

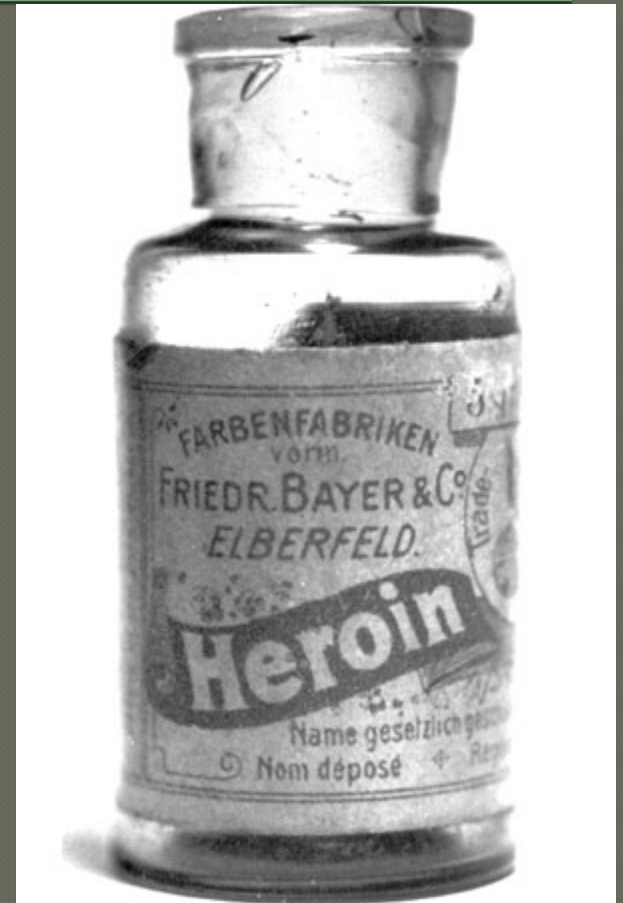
# Incidence of Drug Use

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- 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
  - 39.7% of individuals used illicit drugs at some point during the prior 12 years
  - 6.7% used during the month prior to survey (current users)
  - 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%
- Women with mental health problem more likely to have infants withdraw
- Use of tobacco increased risk of withdrawal in the newborn

# Heroin

- Diacetylmorphine
- Created as a derivative of morphine in 1874 by British scientists
- Commercialized by Bayer as a less dangerous and less potent analgesic than morphine



# Opioid Abuse: Indiana's Price

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- 12<sup>th</sup> highest cost in US: 2007
- 650 million
  
- 8<sup>th</sup> highest per capita
- \$99 per person
  
- \$1.4 billion in drug overdose deaths
- Medical and life time earnings

# Neonatal Abstinence Syndrome

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- ◉ \$64 million cost to Indiana
- ◉ \$97,555 per newborn treated
  
- ◉ Duration of care
  - 2 days – 6 weeks: Inpatient
  - Life time of impact
    - Developmental
    - Congenital

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## ○ Neonatal withdrawal symptoms

- Estimated 48 – 94% of infants exposed to opiates in utero develop signs/symptoms
  - Methadone more common than heroin
  - Buprenorphine



# Common Drugs Leading to Opiate Withdrawal

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- Heroin
- Methadone
- Codeine
- Morphine
- Oxycodone
- Buprenorphine
- Fentanyl

Other drugs resulting  
in withdrawal  
symptoms

- Caffeine
- Nicotine
- Alcohol
- SSRI's

# Neonatal Abstinence Syndrome

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- So what is NAS
- With regards to opiates:
  - The response in the newborn body to the removal of opiate which the CNS had become desensitized to as a result of chronic exposure in utero.
- Drugs of abuse
- Chronic pain management

# Neonatal Abstinence Syndrome

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## ○ Timing varies

- Specific to opiate used
- Placental clearance
- Varies with timing of last maternal exposure
- Polydrug exposures
- Breast feeding

# Timing of Withdrawal Symptoms

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## ○ Heroin

- Half life 2 – 6 minutes
- onset within 12 - 48 hours (out to 4 weeks)

## ○ Morphine

- Half life 2 – 3 hours

## ○ Fentanyl

- Half life 7 hours
- within 24 hours

## ○ Methadone

- onset typically within 48 to 72 hours but can be longer (out to 4 weeks)

## ○ Buprenorphine (subutex, suboxone, buprenex)

- peak symptoms within 48 hours and taper after 5 days

# Methadone Concentration

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- Concentration of methadone is affected by maternal clearance as well as clearance by the placenta and the fetus.
- Umbilical cord blood concentration correlates with maternal dose
- Study of 25 infants exposed to methadone during pregnancy
  - 12 infants required pharmacologic treatment
  - Maternal methadone dose did not correlate with need for treatment and is a poor predictor of NAS severity
  - Infants with higher cord blood methadone concentrations were less likely to have symptoms of withdrawal

# Breast Feeding and Methadone

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- Small amounts of methadone are passed into human milk
- Amount present in milk not felt to be significant enough to prevent withdrawal
  - But breast fed infants are less likely to require treatment for withdrawal
- Maternal serum concentrations up to 100x higher than infant serum concentrations

# Other Considerations

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- Sexual and Physical Abuse is common in substance abuse
- Mental Health comorbidities common in substance abuse
- Polysubstance use: Frequently narcotics may be used with other drugs resulting in alterations of effect or withdrawal

# Drug Testing

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- Meconium: typically will detect use during last trimester of pregnancy
  - Amphetamine, cocaine, PCP, opiates, barbiturates, benzodiazepines



# Drug Testing in the Infant

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- Umbilical Cord: Equivalent to meconium and up to 20 weeks
- Hair: 12 drug panel available
  - no longer than 3 months
  - Can be used in older children to detect environmental exposures
- Nail: 12 drug panel available
  - Finger nail clippings can detect use out to 8 months
  - Toe nail clippings out to 1 year.

# Breastfeeding

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- **Heroin – NO!**
- **Cocaine – NO**
- **Methadone – yes**
  - Babies born to mothers on methadone treatment regimens are less likely to require pharmacologic treatment for withdrawal
  - Statistically no difference in methadone levels in breast milk based on maternal dose
  - Initial levels in breast milk are low but rise quickly during the first 4 days
    - The levels are felt to be clinically insignificant by some authors
- The bioavailability of most narcotics passed through breast milk after first pass metabolism in the liver is low.
- Typically benefits of breast feeding outweigh risks of opiate exposure
- **Must have knowledge of polysubstance abuse and HIV status**

# Neonatal Abstinence Syndrome

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- Central Nervous System
- Autonomic
- Gastrointestinal

# Treatment

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- Prenatal counseling
- Evaluate for signs of withdrawal
- Send a drug test!
  - Urine – fast turn around time but not as sensitive
  - Meconium – much more accurate and may be able to detect drug exposure as early as 16 weeks gestation but long turn around time and dependent on infant stooling which can add additional delay
  - Umbilical Cord – relatively new
- Assessment of mother for hepatitis B and C and HIV as well as other STDs

# Supportive Therapy

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- ◎ This should begin before the infant is born
  - Prenatal counseling
  - Appropriate expectations
  - Begin to teach comfort measures
- ◎ Watch weight gain, temperature stability
- ◎ Swaddling
- ◎ Quiet and low light environment
- ◎ Feeding: potentially every two hours
  - Increase caloric density of feedings to support extra calorie expenditures in the withdrawing infant
  - Up to 150 to 200KCal/kg/day
  - Normal is 100-110KCal/kg/day

# Treatments

- Observation should be 48 to 72 hours
  - Infants at risk for withdrawal from opiates should not be discharged before 48 hours
    - Close follow up is needed
    - Parents need to be aware of signs and symptoms of withdrawal in the newborn
    - Consider teaching NASS or other scoring system
    - Recommendations out to 5 days of life
- Encourage breastfeeding when appropriate
- Neonatal abstinence scoring systems
- Pharmacologic treatment

