Neonatal Abstinence Syndrome: Evidence-Based Practice, What Should You Do?

Carla Worley Saunders, APRN, NNP-BC
Neonatal Advanced Practice Coordinator
East Tennessee Children’s Hospital, Knoxville, TN

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Session Summary
During this session we will examine the epidemiology of IDE and NAS as a public health issue. We will then review the most recent guidelines for treatment of pregnant women with substance use disorders as well as screening, assessment, and diagnosis of infants at risk for NAS. We will explore most recent evidence and varying treatment approaches for NAS.

Session Objectives
Upon completion of this presentation, the participant will be able to:

- describe the impact of intrauterine drug exposure and neonatal abstinence syndrome in the newborn nursery and NICU settings;
- understand AAP guidelines for identification and evaluation of infants at risk for NAS;
- describe treatment options and challenges in NAS.

References
Breastfeeding medicine (2015), 10(3). Mary Ann Liebert, Inc. doi: 10.1089/bfm.2015.9992


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Carla Worley Saunders  APN, NNP-BC
East TN Children’s Hospital  Knoxville, TN

Neonatal Abstinence Syndrome (NAS)

- Constellation of withdrawal symptoms
  - CNS
    - Inconsolability, high-pitched crying, skin excoriation, hyperactive reflexes, tremors, seizures
  - GI
    - Poor feeding, excessive sucking, feeding intolerance, loose or watery stools
  - Autonomic/metabolic
    - Sweating, nasal stuffiness, sneezing, fever, tachypnea, mottling

Fetal Brain Development

2wks: Brain is first organ to develop
4wks: Cerebral hemispheres appear
5-6wks: Cranial nerves identifiable
6-7wks: Brain wave activity begins
7-8wks: Brain represents 43% of embryo
8-9wk: Light sense of touch
13wks: Most of body has sensation to touch
19wks: Daily cycles of biological rhythms
26 +: Brain increases in weight by 400-500%

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Neonatal Drug Withdrawal

"Reported rates of illicit drug use...underestimate true rates..."
55 to 94% of neonates exposed to opioids in utero will develop withdrawal signs.

"Each nursery that cares for infants with neonatal withdrawal should develop a protocol that defines indications and procedures for screening for maternal substance abuse."

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Screening is best accomplished by using multiple methods
- Maternal history (Hep C?)
- Maternal urine testing
- Testing of newborn urine/meconium/umbilical cord

"Urinary screening addresses exposure to the hours immediately before collection. False-negative results in the presence of significant intrauterine drug exposure*"

*Hepatitis C"
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Neonatal Drug Withdrawal

Each nursery should develop and adhere to a standardized plan for the evaluation and comprehensive treatment of infants at risk for or showing signs of withdrawal.

- Supportive therapy first
- Rooming in with mother
- Environment/decrease stimuli
- Nutrition/establish weight gain
- Breastfeeding
- Increased caloric intake

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- Differential diagnoses
- Signs of drug withdrawal can be scored by using a published abstinence assessment tool.
- Clinical assessment & withdrawal assessment tool can guide medication initiation & dosing adjustments
- Optimal threshold score for treatment in any of the published abstinence assessment instruments is unknown
- Confirmed drug exposure but asymptomatic or minimal symptoms do not require pharmacologic therapy.
- Risk vs Benefits
  - lengthen the duration of hospitalization
  - interfere with maternal-infant bonding.

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- REC: Oral morphine or methadone
- Clonidine
  - reduces CNS sympathetic outflow and palliates symptoms of autonomic over activity such as tachycardia, hypertension, diaphoresis, restlessness, and diarrhea.
- Buprenorphine
- Polysubstance exposure may require multiple adjuncts
- Paregoric contraindicated
  - multiple opiates, alcohol, anise
- Tincture of opium contains a 25-fold higher concentration of morphine
  - drug error
  - morphine overdose.

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- SSRIs: Withdrawal or Toxicity?
  - Symptoms: very similar to opiates – continuous crying, irritability, jitteriness, and/or restlessness; shivering; fever; tremors; hypertonia or rigidity; tachypnea or respiratory distress (PPHN); feeding difficulty; sleep disturbance; hypoglycemia; and seizures.
  - Onset: hours to several days after birth and usually resolved within 1 to 2 weeks.

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Maternal Opioid Treatment:
Human Experimental Research (MOTHER study)

Infants born to mothers treated with buprenorphine:
- Shorter hospital stays (10 vs 17.5 days)
- Shorter treatment durations for NAS (4.1 vs 9.9 days)
- Required a lower cumulative dose of morphine (1.1 vs 10.4 mg)

compared with infants born to mothers on methadone maintenance


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Neonatal Drug Withdrawal

- FANNP 27th National NNP Symposium: Clinical Update and Review
- A11: Neonatal Abstinence Syndrome: Evidence-Based Practice, What Should You Do?
ABM Clinical Protocol #21: Guidelines for Breastfeeding and Substance Use or Substance Use Disorder, Revised 2015

- Counsel women under any of the following circumstances not to breastfeed (III):
  - Not engaged in substance abuse treatment, or engaged in treatment and failure to provide consent for contact with counselor
  - Not engaged in prenatal care
  - Positive maternal urine toxicology screen for substances other than marijuana at delivery [see (b) above]
  - No plans for postpartum substance abuse treatment or pediatric care
  - Women relapsing to illicit drug use or legal substance misuse in the 30-day period prior to delivery
  - Any behavioral or other indicators that the woman is actively abusing substances Chronic alcohol use.

AAP Guidelines - Newborn Observation

**Risk Factors**
- No prenatal care
- Limited prenatal care
- History of substance use or abuse
- Any positive screen during pregnancy
- Positive UDS on admission
- ? Hep C positive

**Recommendation**
- Observe in the hospital for 4 to 7 days (5 may be sweet spot)
- Early outpatient follow-up
- Reinforce caregiver education about late withdrawal signs

East Tennessee Children’s Hospital

One of four designated Comprehensive Regional Pediatric Centers in Tennessee.
- 152 inpatient beds
- 70,000 Emergency Department visits
- 6,000 hospital admissions

ETCH Treatment Plan

Holistic multidisciplinary approach

**Non-Pharmacological**
- Environment
- Diet
- Cuddlers

**Pharmacological**
- Oral Morphine Sulfate
  - Symptom-based vs weight-based dosing
- Non-narcotic
  - Acetaminophen
  - Simethicone
Changes made through PDSA Cycles

- Clonidine by 20% QOD
- Weans by 20mcg q24hrs
- Smaller weans 20,10,5 (~10%)
- Concurrent weaning of PB & C
- Re-escalate for 2 consecutive scores
- Re-escalate for 3 consecutive scores
- Rescue dosing
- Clonidine by 20% every day
- Clonidine by 50% x 2 days
- Phenobarbital by 20% every day
- Phenobarbital by level
- Eliminate sleep score at 28d

Primary Outcome Measure:
Length of Stay (LOS)

ETCH Protocol

- NBN observation min 4-7 days
- Transfer & Treat: 3 scores >8 or 2 scores >11
- Initiate dose based on score
- Escalate every score >8 until 48hrs without elevated score
- Nurse driven by protocol
- Wean daily by ~ 10%
- *decreased LOS by 7 days
- Rescue not re-escalation!!
- Nurse driven by protocol
- Max morphine (200mcg) or losing control (>1 rescue in 24hrs)
  - Adjuncts: Clonidine, phenobarbital
  - timing, symptoms, exposure
- Weaning adjuncts
- Observation

ETCH Symptom Based NAS Algorithm

Primary Outcome Measure:
Length of Stay (LOS)
Physical Challenges

Environment
Pharmacy
Daily NAS rounds
Repackaging
Stocking
Documentation
Social Work
DCS workload
Family Support
Staff Support

Volunteer Services
Helping hands!!
Phone, Door, Cuddling
Rehabilitation
Services
Speech Tx
Physical/Occupational Tx
Security
Increased FTEs
Rounding

Mental/Emotional Challenges

Attitudes / Perceptions
Personal prejudices
Preventable nature of condition
Feelings
Confusion/fear
Legal/Ethical Issues
HIPPA
Nurses placed between a rock & hard place

Family/Caregiver
Parental addiction/recovery
Mental health disorders
Literacy
Comprehension/retention (developmental arrest)
Repetition

Nursing Challenges

Complexity of caring for infant with NAS
Acute phase
Chronic phase
Complexity of caring for family
Substance abuse
Social complexities
Social stigma
Education
Community support

Educational deficit regarding the science of addiction

The problem is not the problem, it’s your attitude about the problem – Capt. Jack Sparrow

• Nurse interview will be embedded in this slide