The Challenges of Neonatal Abstinence Syndrome (NAS)

Pamela Jimenez, RN, MSN, CFNP/CPNP
Coordinator Continued Care Nursery
Christiana Care Health Services
Objectives

* Identify infants at risk for Neonatal Abstinence Syndrome (NAS)
* Describe the common discrepancies with the Finnegan scoring system
* Understand the management of the infant providing non pharmacologic and pharmacologic interventions
* Describe the criteria to transition the infant to home
Addiction: what is it?

* Addiction is 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.

* American Society of Addiction Medicine
Challenging situation

- Struggle with:
  - Families coping with addiction
  - Nurse’s role to focus on caring for the infant and helping to obtain social services
  - Ethical dilemma
What we as nurses need to understand!

- Substance addiction is a treatable illness.
- Addiction is a primary disease requiring specialized treatment to achieve recovery.
- The threat of criminal prosecution prevents many women from seeking prenatal care and treatment for substance abuse.
- The nurse’s role is focused on social service rather than law
The ANA directs registered nurses working in the perinatal field to seek out appropriate rehabilitation and therapy treatment for women abusing substances (illicit or prescribed drugs, and/or alcohol) and to identify and offer appropriate therapy to infants exposed to these substances. The registered nurse works with social services, rather than law enforcement or the judicial system, to obtain help for the woman and infant.
Babies at risk

* Look at the maternal history
* Absent or late prenatal care
* Previous history of drug abuse
* Previous unexplained late fetal demise
* Placental abruption
* Unexplained IUGR, LBW, Uro-genital abnormalities
* Maternal medications taken during pregnancy-prescribed or illicit use
* History of physical or sexual abuse
* Clinical evidence of substance abuse in family members
What drugs are we seeing

- Methadone
- Morphine
- Codeine
- Heroin
- Fentanyl
- Percocet
- Marijuana
- THC
- Tobacco
What do we need to do?

- Educate ourselves
- Provide early identification, screening and education to mom
- Prenatally, mom needs to know:
  - Possible teratogenicity and effects on fetus
  - Altered brain development and organization
  - Altered maternal behaviors
  - Altered placental blood flow
  - Understand barriers to care
Barriers to Treatment

- Fear of criminal prosecution and removal of children by legal system or regulatory agencies
- Absence of adequate child care resources for existing children
- Lack of transportation services
- Poor access to obstetrical care
- Social stigmatization by medical providers
- Lack of treatment services addressing women’s issues
- PTSD - care often seen as violation
Methadone

- Methadone has been used for over 25 years to treat addiction in pregnant
- Labeled pregnancy category C by the FDA.
- Schedule II controlled substance
- No increase in congenital defects observed
- 60% to 90% of infants born to mothers on chronic methadone therapy withdrawal.
- There are no controlled data in human pregnancy. Methadone should only be given during pregnancy when benefit outweighs risk
- Increased risk of spontaneous abortion or preterm delivery if weaned during pregnancy
Advantages of Methadone

Maintains opioid concentration

* Minimizes craving
* Suppresses abstinence symptoms
* Blocks euphoria
* Prevents fetal distress associated with detoxification
* Improved safety profile
* Counseling and monitoring for illicit drug use
May promote a more stable and predictable environment

More likely to have prenatal care

Better nutrition and weight gain

Less likely to have a preterm or LBW infant

Pregnant women on methadone are doing the best they can do for their unborn baby

Subutex usage on the rise
Disadvantages

* Increasing dose between 6-9 months due to growth of fetus.
* Mother is unlikely to achieve detoxification after delivery and often appears stoned.
* Dose needs to be decreased significantly directly following delivery.
* May cause severe and prolonged NAS.
* Detox in general difficult.
What is NAS?

- It is a condition that appears as the body attempts to remove addictive substances from the circulation (NeoAdvances, 2010)
- In utero, the infant is exposed to certain medications or drugs that the infant will develop tolerance and dependence to. When the infant is delivered, the supply is suddenly cut off and the symptoms they exhibit is withdraw from the medications or drugs
Consider type of drug exposed to

* When will the infant withdraw
* Depends on type of drug exposure
* Poly-substances
* Timing and amount of last maternal use
* Maternal and infant metabolism and excretion
* Dose of Methadone doesn’t predict the severity of withdrawal
Withdrawal onset

* Drug Onset Duration
  * Heroin 24 – 48 hours
  * May be delayed 5 – 7 days and can last 1 – 2 weeks
  * Methadone 2 – 7 days
  * May be delayed 5 – 7 days and can last weeks to months
  * Buprenorphine 40 – 70 hours and can last weeks to months.
  * LOS may be shorter than with methadone.
  * Other opioids 48 – 72 hours and can last weeks to months
  * **Cannabis:** may have delayed onset after 10 days-weekly f/u with PCP important especially the first month.
Keep in mind: not all NAS babies are a product of addiction

- Examples:
- Binge Eating: prescribed – Suboxone
- Anxiety: Cymbalta
- Depression: Zoloft
- ADHD: Methylphenidate
- Hallucinations: Clozaril
- Monitored pain control
Determining Infant exposure

- Urine
  - Has high false negative rate
  - Needs to be collected ASAP
- Meconium
  - Tells long term exposure
  - Results not available for days
- Umbilical Cord
  - Easier availability to obtain specimen
  - Expensive
What we do?

- Initiate scoring with in 3 hrs then q 3hrs thereafter

- History of Finnegan:

  Dr. Finnegan devised the Finnegan Neonatal Abstinence Scoring Tool (FNAST) in 1975 after she noticed an “emerging epidemic of passively addicted newborns due to intrauterine heroin exposure.” (Maguire, Cline, Parnell, & Tai, 2013).
NAS Affects many Systems
Finnegan Neonatal Abstinence Scoring Tool (FNAST)

- A clinical tool that assesses 21 withdrawal signs and symptoms for an opiate-exposed infant
- It is broken down into 3 main areas of disturbance:
  - Central Nervous System
    - Irritability, increased wakefulness, shrill cry, tremors, increased tone, seizures
  - Metabolic, Vasomotor, and Respiratory
    - Sweating, frequent yawning, sneezing, mottling, tachypnea
  - Gastrointestinal
    - Excessive sucking, poor feeding, regurgitation, vomiting, loose/watery stools
The scoring interval...

- **Important:** this is not a snapshot in time
  - It needs to be a continual assessment of symptoms from the last score documented until the current score documented
  - For example, if we score a patient at 0800 and we are scoring them at 1200, if the patient has only slept from 1015-1200, we would score a 2 for sleeping < 2 hours

- **Important** to calm the infant as much as possible during the assessment to get a better assessment of their withdrawal

- **Mom’s** are very aware of the scoring and will ask repeatedly about the score.
Things we Consider when scoring

- Have all of the babies needs been met?
  - Hungry, last dose, last wean
- How many days of life is the baby?
  - For > 43 weeks of age post-menstrual, adjust the trigger score by 2
- What type of environment is the baby in?
  - Quiet
  - Dim lights
  - Free from strong smells
  - Free from over stimulation
Non-Pharmacologic

- Swaddling
- Rocking
- Cuddlers
- Quiet Environment
- Excoriation
- Poor Feeding
- Loose/watery stools
- Nasal Stuffiness
Non-Pharmacological

* Therapeutic relationship with family
* Provide confidentiality
* Non-judgmental and supportive attitude
* Consistency of care
* Support breastfeeding
* Skin to skin
* Encourage family to participate in care
How to Help

Signs

* Excessive crying
* Sleep problems
* or
* Hyperactivity/tremors

How to help

* Offer pacifier, hold, rock, walk with baby, swaddle
* Quiet room with decreased light, soft music
* Reduce patting or unnecessary touching
* Skin – skin contact
* Hold baby close
* Educate Safe Sleep
Signs:
* Signs:
* Poor feeding
* or
* Spitting up

How to Help:
* Small frequent meals
* Swaddle during feeds
* Feed slowly
* Quiet/calm room
* Let baby rest between feeds
* Keep bed linen clean and dry
* Avoid harsh smells
How to Help

**Signs**

- Nasal Stuffiness
- Fever/sweating
- Loose watery stools

**How to Help**

- Clean mouth and nose with bulb syringe before feeding
- Do not over dress baby
- Cotton t-shirt, diaper and light sleep sack
- Frequent diaper changes
- Ointment to prevent diaper rash
Initiation

* Once infant transferred to NICU or 4A and continues to have 2 scores >8 or 1 score >12, Morphine will be initiated

* Morphine:
  * IV – 0.02mg/kg/dose q 3 hrs
  * PO – 0.05mg/kg/dose q 3 hrs

Escalation

* If the infant continues to have 2 consecutive scores >8 or 1 >12, notify the medical team

* Increase Morphine:
  * IV by 0.01 mg/kg/dose
  * PO by 0.02mg/kg/dose
Weaning Morphine

**Weaning**

* If the infant has scores < 8 for 48 hours, wean 10% of the current dose
  * **Wean morphine every 24 hours by 10% of the previous dose for scores ≤ 8.**
  * **Morphine is to be discontinued when dose is < 0.02mg/kg/dose PO**

**Backslide**

* During the weaning process, if the infant is having 2 consecutive scores > 8, consider going back to the previous dose before the last wean in stepwise fashion until scores are ≤ 8.
  * May hold the wean for scores ≤ 8 for 24 hours.
When to start?

* If Morphine exceeds 0.2mg/kg/dose PO with scores > 8 or unable to wean for 2 days
* And there is poly-substance exposure

Dose

* Loading dose:
  * PO - 16 mg/kg/dose q 12 hrs x 2 doses
* Maintenance dose:
  * 5 mg/kg/dose PO daily
Weaning Phenobarbital

* Wean by 20% of the dose when the Phenobarbital wean was initiated
  * Wean Phenobarbital off before weaning Morphine
  * Wean the dose every 48 hours
* Discontinue Phenobarbital when dose is $\leq 2$ mg/kg/dose
Everyday considerations

* Continual monitoring of NAS
* Non-medicated infant will be monitored for 5-7 days
* Involving and educating the family
* Involve DFS when indicated
* During escalation and weaning, ensure non pharmacologic interventions are available
Preparing for Discharge

* Social Work active in all cases
* DFS cleared if appropriate- every + reported
* No barrier to care identified
* Primary caregiver is without active substance abuse problem and has shown sufficient ongoing care with extended period of in-house care
* PCP identified and willing to accept infant 1-2 days after d/c
* Home RN visits to follow NAS symptoms and weight 2 vss over first 2 wks if off Morphine
* On Morphine: 1-2 vss/week until off
* Community Home visits
* State Developmental program (Child watch)
* Outpatient PT/OT as needed
* Verbal transfer of care between providers
Criteria for Discharge on Morphine

Social Criteria

* Primary caregiver is stable in treatment or has medical supervision
* Primary caregiver has shown sufficient ongoing care
* Family agrees to discharge with outpatient weaning
* No barriers to discharge that would impact medical care or safety
* Identification of support system and care giver exhibits understanding of NAS symptoms and dosing.

Medical Criteria

* Team –based and family centered care.
* D/C of Morphine not expected within next week
* Infant not on Phenobarbital.
* Infant weaned at least 2 successful weans in hospital without recurrent backslides for 48-72 hrs
* Pharmacy identified to dispense appropriate form/dose of morphine
* PCP willing to accept out patient weaning.
PCP Weaning

* Detailed schedule will be faxed to PCP willing to accept.
* PCP will continue to subtract 10% of the first stable dose achieved in hospital on a weekly basis if symptoms are controlled.
* If withdrawal severe, will return to the previous dose that baby was stable for 2-3 days until symptoms stabilize.
* If unable to control, re-admit to 4A- 733-4375 for help
Script

* New script written weekly for 10 day supply
* 0.4mg morphine/ml
* Alcohol free morphine
* Indicate number of mls family needs to give with each dose
* Write # of mg/dose for pharmacy to double check
* Do not change dosing frequency following discharge
* Make certain family demonstrates dosing new dose.
* Should focus on control of symptoms:
* Experiencing few signs of withdrawal
* Feeding and growing well
* Ability to sleep 2-4 hours after feed
* Ensure non-pharmacological measures are being carried out by caregiver
* Safety and compliance at home
* Remember we are all obligated to report concerns!
At home

- Continue supportive care: Infant may continue to exhibit mild NAS symptoms for months depending upon drug exposed to. Educate family!
- Loose stools/gas may continue a week or more following wean
- Nutrition and weight gain important to follow
- Lower extremity muscle tone last to normalize.
- PT exercises given to mom’s help.
- Partner with family to help support treatment and care
- Encourage follow up visits to treatment center, Pediatrician and child watch
- Evaluate home social system
- Remember we are guests and not mandatory fixture
<table>
<thead>
<tr>
<th>Drug</th>
<th>signs</th>
<th>onset</th>
<th>Duration of signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSRI’s</td>
<td>Crying, irritability, tremors, poor suck, respiratory distress, hypertonia</td>
<td>Hours - days</td>
<td>1-2 wks</td>
</tr>
<tr>
<td>Alcohol*</td>
<td>Hyperactivity, crying, irritability, tremors, poor sleep, hyperphagia</td>
<td>3-12 hrs</td>
<td>18 months</td>
</tr>
<tr>
<td>*significant teratogen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicotine</td>
<td>Irritability, hypertonicity, CNS/GI signs</td>
<td>Hrs - days</td>
<td>Wks – mos - years</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>Hypotonia/hypertonia, poor suck, hyperthermia, apnea, tremors, vomiting, tachypnea</td>
<td>3 – 7 days months</td>
<td>months</td>
</tr>
<tr>
<td>Barbiturates</td>
<td>Irritability, tremors, crying, vasomotor instability, diarrhea, vomiting, hypertonia, poor sleep</td>
<td>1 – 14 days</td>
<td>4 – 6 months</td>
</tr>
<tr>
<td>Cocaine*</td>
<td>Irritability, hyperactivity, tremors, high-pitched cry, excessive suck</td>
<td>Within first 24 hours 2 – 3 days</td>
<td>longer with heavy maternal use</td>
</tr>
<tr>
<td>Amphetamines*</td>
<td>Irritability, hyperactivity, tremors, high-pitched cry, excessive suck</td>
<td>Likely represents effects of drug rather than withdrawal</td>
<td></td>
</tr>
<tr>
<td>*risk of preterm birth, abruption, IUGR</td>
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Withdrawal Impacts Growth

- Increased caloric expenditure due to increased metabolic symptoms
- Often have increased caloric requirement 130-250 kcal/kg/day
- If continued weight loss may need to have added calories.
- These babies prone to weight loss, poor growth, failure to thrive
- How much is environmental?
Breast Feeding encouraged with Methadone/Subutex as long as there are no other substances identified.

About 3-4% is thought to cross from milk to baby and my help withdrawal symptoms.
Cannot control what happens at home

* **Educate mom about contraindications to breast feeding while Intoxication with alcohol or other drugs, HIV Positive, Hep C with cracked and or bleeding nipples**
* **Following drug/alcohol usage:**
  * Educate mom how to express and when to discard or store breast milk
  * Educate mom on developing a safety plan for feeding baby should she indulge in drug/alcohol usage.
* **Breastfeeding women who use stimulants (amphetamines, ecstasy, or cocaine) should understand the risks, and advised not to breast feed for 24 hours after use**
Breastfeeding women who smoke tobacco or cannabis should be advised to breast feed prior to smoking and to always smoke away from the baby.

Breastfeeding women should be informed that alcohol does pass through breast milk, and there is no known safe level of alcohol consumption. If breast feeding mom does drink, she should be educated to breast feed prior to consuming alcohol and or wait a minimum of 3-4 hours after the last drink before feeding again.
Education

* Safe sleep: Review at every visit and remind that sleeping with baby is not safe!
* Assess for crib. If none, refer to Cribs 4 Kids
* Review Abusive Head Trauma
  * 14 cases in 2014. many were NAS babies.
What’s next?

* Follow up with Child Development Watch 1 month following D/C
* Communication between all agencies involved.
* Grant with Internal Medicine, Project Engage, OB and Peds to improve outcomes
* State wide model for consistency.
It takes a village...

Treating families and infant needs to be a multidisciplinary approach to treating infants and families with NAS.

Our goal is to provide the most consistent and comprehensive care for them while ensuring safe patient care.
Partners

* **Project Engage**: 733-6107
* **Brandywine Counseling**:  
  * (302) 656-2348 - Wilmington  
  * (302) 454-3020 - Newark  
  * (302) 856-4700 - Georgetown  
  * (302) 346-5080 - Dover
* **Connections**: 302) 984-3380
* **Pace**: 302-999-9812
Thank You

* Pam Jimenez
* Nurse Practitioner
* Coordinator Continued Care Nursery
* Christiana Care Health Services
* 302-733-2606
* pjimenez@christianacare.org