Setting

- Level III NICU
- 27 Private Rooms
- ~400 Admissions per year
- Average Daily Census: 25-26
Aim

- Reduce the length of stay of Neonatal Abstinence Syndrome (NAS) patients by 10% 2017
- Attain high reliability and consistency with NAS scoring by staff
- Improve parent education and involvement
- Decrease staff fatigue and emotional stress associated with caring for families affected by NAS
Interventions

- Attain high reliability and consistency with NAS scoring by staff:
  - Provide education to nursing staff on NAS scoring using the Finnegan at the department retreat
  - A video of NAS scoring is made available for review at SV-Net.
  - IRR was established by direct observation by the assigned NNP and the clinical bedside nurse
FINNEGAN SCALE
INTERRATER RELIABILITY

- **PURPOSE:** Assess the accuracy of using the Finnegan Neonatal Abstinence Scoring Tool by monitoring inter-observer agreement (OA).

- **ELEMENTS:** NNP and Clinical bedside nurse will individually score the infant using the Finnegan scale. The NNP will have a worksheet to complete. Clinical nurse will use Finnegan in EMR.
  - The scores will be compared to establish inter-observer agreement.

- **COMPLIANCE:** Anytime the NNP Finnegan score and the matched clinical bedside nurse score are in agreement >/= 90%.
INTERRATER RELIABILITY

- Benchmark for this measure is 80%
- The goal is to obtain up to 4 joint observations per week.
- The numerator is the number of times a joint assessment is done using the Finnegan and scores are in agreement 90%.
- The denominator is the number of times a joint assessment is done using the Finnegan.

<table>
<thead>
<tr>
<th>Total Number of Items in Agreement</th>
<th>Total Number of Items in Disagreement</th>
<th>Percentage Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>95%</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>90%</td>
</tr>
<tr>
<td>17</td>
<td>3</td>
<td>85%</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>80%</td>
</tr>
</tbody>
</table>
Intervention

- Standardize NAS medical management
  - NAS admission protocol
  - NAS admission EPIC order set
2016 NAS management

Management of the NICU Infant with Prenatal Opiate Exposure

1. Begin Morphine Sulfate PO when scores are > or = 8 on any 3 consecutive scores or if 2 scores are > or = 12.
   Dosing guidelines-use Birth weight for calculations
   Score  | Oral Morphine dose  | IV dose (not tol PO)
   ---  | ---  | ---
   8-10  | 0.04mg/kg q 3 hr | 0.007 mg/kg q 3 hr
   11-13 | 0.06 mg/kg q 3 hr | 0.01 mg/kg q 3 hr
   14-16 | 0.08 mg/kg q 3 hr | 0.013 mg/kg q 3 hr
   17+   | 0.1 mg/kg q 3 hr  | 0.017 mg/kg q 3 hr

If scores remain > or = 8 for 3 consecutive or > or = 12 for 2 consecutive, increase dose to the next range. Examples 0.04mg/kg; 0.06 mg/kg; 0.08 mg/kg; 0.1 mg/kg. Max PO dose morphine is 0.2 mg/kg/dose (Pediatrics Feb 2012)

2. Rescue dose-If needed, repeat previous dose between scheduled dose intervals.

3. Consider adding Clonidine or Phenobarbital if morphine dosage reaches 0.125 mg/kg PO or for infants who are difficult to control with or wean from morphine.
   Clonidine: start with 1 mcg/kg/dose PO q 6 hours. Max dose is 2 mcg/kg/dose q 6 hours (up to 8 mcg/kg/day). Wean by 50%. If stable for 12 hr, then wean by 50%. If stable for next 12 hr, DC Clonidine.
   Phenobarbital: Loading dose 16 mg/kg, and then maintenance dose 5-8 mg/kg/day in 2 to 4 divided doses (every 6-12 hr).

4. After the score is < 8 for 48 hours, begin weaning Morphine. Decrease the dose by 10% (of the original control dose) every 24-48 hours when scores remain < 8. Document the dose of morphine that achieved control of NAS and the planned 10% weaning dosages in the Baby Steps progress note and

5. If the NAS scores are > or = 8 on 2 consecutive scores, make sure non-pharmacologic measures are optimized (swaddling, holding, decreased stimuli etc.) before going back to the previous dose. If scores remain elevated, either weight adjust med or continue to increase the dose until scores < 8. Once stabilized on new dose for minimum of 48 hours, resume 10% wean but consider weaning more slowly.

6. Discharge: Observe 48-72 hours off morphine before discharge.
Intervention

- Standardize non-pharmacologic measures
- RN in-service on how to provide non-pharmacologic measure
- Revision of NAS policy to reflect medical protocol
Policy:
This policy is intended to outline the nursing management of infants weaning from opiate medications for pain management or from prenatal opiate exposure.

Assessment:
1. Assess for risk factors:
   a. Infants who have received 5 days or more of continuous, scheduled or frequent PRN Morphine or Fentanyl.
   b. Prenatal exposure to opiates.
2. Assess for symptoms of withdrawal in high risk infants:
   a. Poor feeding
   b. Diarrhea
   c. Vomiting
   d. Excessive weight loss
   e. Dehydration
   f. Fever
   g. Seizures

Patient Care Management:
1. Obtain an order to begin abstinence scoring when symptoms are identified.
2. Conduct and record Finnegan Abstinence Score every 3 hours:
   a. Observe infant for 1 minute prior to waking.
   b. Un-swaddle and gently wake infant.
   c. Count respiratory rate for 1 minute.
   d. Take temperature.
   e. Inspect for signs of skin excoriation due to excessive friction. This does NOT include diaper excoriation.
   f. Evaluate tone and Moro reflex.
   g. Observe stools.
   h. Re-swaddle and observe for 1 minute.
   i. Feed infant, then assess for excessive sucking, poor feeding, and vomiting 30-60 minutes after feeding.
3. Place a score in each section of the score sheet and add total.
4. Consider adjusting score after consultation with the medical team if the symptom score is believed due to another medical condition.
5. Calculate an adjusted score by subtracting any score that has been determined to be disease related.

6. Reduce environmental stimuli at infant’s bedside including light and noise.
   Encourage parental participation in providing soothing environment. (Refer to NAS Management algorithm)
7. Consult Child Life Specialist as needed.
8. Alter environment stimuli as appropriate for adjusted gestational age.
9. Notify MD/NRP if adjusted scores are >9 on three consecutive scores, or two consecutive scores >12.
10. For infants >21 days of age and >44 weeks gestation:
    a. Do not score for sleep
    b. May feed and score every 3-4 hours
11. Continue scoring until opiate use has been discontinued for 48 hours.

Reportable Conditions:
Report the following conditions to the MD/NRP:
1. Diarrhea (6 or more stools/day)
2. Severe emesis (vomiting > 10% of intake)
3. Increased ventilator support
4. Tachycardia (HR > 20 bpm over baseline, not related to hypovolemia)
5. Systolic BP > 90
6. Continuous inconsolable crying despite nursing interventions
7. Seizures
8. Abstinence scores as outlined above.

Reference:

Reviewed:
08/24/2011, 03/26/2014, 04/22/2015, 05/04/2016, 03/19/2019

Interventions

- Improve parent education and involvement:
  - Work with Marketing Department to develop written information to be provided for parents of infants with NAS:
    - Letter explaining NAS symptoms and treatment, NAS scoring criteria, Morphine weaning plan
Interventions

- Decrease staff fatigue and emotional stress associated with caring for families affected by NAS
  - Implementation of Family centered care rounds
  - Antenatal consultations including social work involvement and tour of NICU
BREASTFEEDING

- Breastfeeding and the provision of expressed human milk should be encouraged if not contraindicated for other reasons.
- Likely reduces:
  - Need for pharmacotherapy
  - Infants length of stay
- Minimal transmission of methadone or buprenorphine to breast milk
- Only 2 contraindications:
  - Poly drug abuse or illicit drug use
  - HIV
MEASURES

- 1. Length of Stay
- 2. Inter-rater reliability of NAS scores
- 3. Compliance to NAS medical protocol
- 4. Cost Savings
Our NICU

Patient Percentage

- Clonidine
- Methadone
- Morphine
- Phenobarbital
- None

Mednax network

Patient Percentage

2012  2013  2014  2015  2016  2017  2018

Clonidine
Methadone
Morphine
Phenobarbital
None
Results

NASDAQ-Interrater Reliability

- 2016
- 2017
- 2018
- 2019
What We Learned

Using standardization and a system of audits we were able to institute change as seen through:

- Reduction in overall LOS
- Hospital cost savings
A. Initiation, escalation & stabilization

- NAS \( \geq 9 \times 3 \) in a row or \( \geq 12 \times 2 \) in a row
- Single starting dose for IV or enteral dosing
  - Not determined by scores
B. Weaning

- Breastfeed if not contraindicated by maternal medications or illegal substances.
- Increased calories = Similac Total Comfort 22 cal/oz
- If Rx is needed for home, only one dosing volume will be written for. No longer a tapering prescription.
C. Backslide

- Weight adjustment occurs here if needed.
- On demand feedings if applicable.
D. Adjunct

- Based on drug exposure

**Neonatal Abstinence Syndrome Management: D. Adjunct**

- Need to add adjunct
- Exposure to barbiturate and/or benzodiazepine?
  - Yes
  - Trial one time load of phenobarbital = 16 mg/kg PO x1. If scores continue to be high, can start maintenance dose 5-8 mg/kg daily or 2.5 -4 mg/kg BID or add clonidine 1 mcg/kg PO Q6H.
  - No
  - Start clonidine 1 mcg/kg PO Q6H

- Already on adjunct
  - Continue scoring Q3H

- No two consecutive 9 or higher
- Two consecutive 9 or higher

- GO TO WEANING
- Has it been at least 24 hours since clonidine was added or dose increased?
  - Yes
  - Increase clonidine dose
  - No

**Adjunct therapy is indicated when there is:**

- a third backslide after initiation of therapy,
- when the MS04 dose is greater than 0.1 mg/kg/DOSE (adjunct therapy can be added at the same time as an increasing MS04 dose),
- or after two weeks with no progress.

**Notes on Clonidine Dosing**

- If escalating dose, can increase dose or frequency (example: 1 or 2 mcg/kg PO Q6H).
E. Chronic

- Drop sleep scores with PMA $\geq 44$ weeks.
- Can feed Q3-4H and score Q3-4H
Thank you