Welcome!

Neonatal Teams
NAS Project Level II Spread
May Action Period Call

Ohio Perinatal Quality Collaborative
May 13, 2014
Please don’t put us on HOLD!

If you need to step away:

– Use the **MUTE** button on your phone or

– You can use *6 to place the call on MUTE and *6 to come off of MUTE
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 pm</td>
<td>Welcome, review of Agenda, roll call</td>
<td>Susan Ford, RN</td>
</tr>
<tr>
<td>3:10 pm</td>
<td>Finnegan Scoring Tool Overview</td>
<td></td>
</tr>
<tr>
<td>3:30 pm</td>
<td>Non-Pharmacological &amp; Pharmacological Bundles</td>
<td>Scott Wexelblatt, MD</td>
</tr>
<tr>
<td>3:50 pm</td>
<td>Quality Improvement Framework</td>
<td>Heather Kaplan, MD</td>
</tr>
<tr>
<td></td>
<td>• The Model for Improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Key Driver Diagram</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• PDSA’s</td>
<td></td>
</tr>
<tr>
<td>4:20 pm</td>
<td>Next Steps/Q &amp; A</td>
<td>Susan Ford, RN</td>
</tr>
</tbody>
</table>
Objectives for today’s call:

• Describe the components of inter-rater reliability for the D’Apolito Scoring Tool

• Describe the components of both the pharmacological and non-pharmacological bundles in the Ohio NAS Protocol

• Provide an overview of the Model for Improvement and prepare to complete first PDSA cycle
Participating Neonatal Teams

- Adena Health System
- Atrium Medical Center
- Blanchard Valley Hospital
- Elyria Memorial Healthcare
- Fort Hamilton Hospital
- Genesis Healthcare
- Good Samaritan - Dayton
- Kettering Medical Center
- Licking Memorial
- Lima Memorial
- Marion General Hospital
- MedCentral Health System
- Mercy Health West

- Mercy Hospital Fairfield
- Mercy Medical Center - Canton
- Mercy Regional Medical - Lorain
- ProMedica Bay Park
- Soin Medical Center
- Southern Ohio Medical Center
- Southview Medical Center
- Springfield Regional Medical Center
- St Rita’s Medical Center
- The Christ Hospital
- TriPoint Medical Center
- Trumbull Memorial Hospital
- Upper Valley Medical Center
Roll Call:
Please sign in with your hospital affiliation and the names of your team members on the call in the Question box.
**Global Aim**

To reduce the number of moms and babies with narcotic exposure, and reduce the need for treatment of NAS.

**Smart Aim**

By increasing identification of and compassionate withdrawal treatment for full-term infants born with Neonatal Abstinence Syndrome (NAS), we will reduce length of stay by 20% across participating sites by June 30, 2015.

**Key Drivers**

1. Prenatal Identification of Mom
   - Implement Optimal Med Rx Program

2. Improve recognition and non-judgmental support for Narcotic addicted women and infants

3. Attain high reliability in NAS scoring by nursing staff

4. Optimize Non-Pharmacologic Rx Bundle
   - Initiate Rx If NAS score > 8 twice.
   - Stabilization/Escalation Phase
   - Wean when stable for 48 hrs by 10% daily.
   - Swaddling, low stimulation.
   - Encourage kangaroo care
   - Feed on demand-MBM if appropriate or lactose free, 22 cal formula

5. Standardize NAS Treatment Protocol
   - Establish agreement with outpatient program and/or Mental Health
   - Utilize Early Intervention Services

6. Connect with outpatient support and treatment program prior to discharge

7. Partner with Families to Establish Safety Plan for Infant
   - Establish agreement with outpatient program and/or Mental Health
   - Utilize Early Intervention Services
   - Collaborate with DHS/ CPS to ensure infant safety.

8. Partner with other stakeholders to influence policy and primary prevention.
   - Engage families in Safety Planning.
   - Provide primary prevention materials to sites.

**Interventions**

- All MD and RN staff to view “Nurture the Mother- Nurture the Child”
- Monthly education on addiction care
- Fulltime RN staff at Level 2 and 3 to complete D’Apolito NAS scoring training video and achieve 90% reliability.
- Swaddling, low stimulation.
- Encourage kangaroo care
- Feed on demand-MBM if appropriate or lactose free, 22 cal formula
- Initiate Rx If NAS score > 8 twice.
- Stabilization/Escalation Phase
- Wean when stable for 48 hrs by 10% daily.
How will we accomplish our AIM?

• Develop and implement a **standardized process** for the identification, evaluation, treatment and discharge management of an infant with neonatal abstinence syndrome.
  – Standardization of Scoring Tool; improve consistency in use of Modified Finnegan Tool with D’Apolito video
  – Standardization of protocol bundles
  – Small tests of change (PDSA’s) towards implementing standardized protocol into Ohio hospitals

• Create a culture of compassion, understanding, and healing for the mother infant dyad affected by the problem of neonatal abstinence syndrome.
  – Nurture the Mother-Nurture the Child video
# Moving Towards a Standardized Approach

<table>
<thead>
<tr>
<th></th>
<th>OCHA Protocol</th>
<th>OPQC Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scoring Tool</strong></td>
<td>Modified Finnegan; with a 90% or greater inter-rater reliability</td>
<td>79% use a Modified Finnegan; 71% of the teams have trained their nursing staff (? inter-rater)</td>
</tr>
<tr>
<td><strong>Non-Pharm Bundle</strong></td>
<td>Swaddle, Comfort, MBM or consider low lactose, 22 kcal</td>
<td>100% of teams do at least one element of the bundle</td>
</tr>
<tr>
<td><strong>Initiate</strong></td>
<td>NAS score:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 8 q3h x 2 (twice)</td>
<td>46% use the OCHA protocol guidelines to initiate pharmacological treatment</td>
</tr>
<tr>
<td></td>
<td>&gt; 12 x 1 (once)</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmacologic Bundle</strong></td>
<td>Drug: Morphine/Methadone</td>
<td>92% use Morphine(58%) OR Methadone(33%) as their primary medication; 46% start 0.05 mg/kg</td>
</tr>
<tr>
<td></td>
<td>0.05 mg/kg PO</td>
<td></td>
</tr>
<tr>
<td><strong>Escalate</strong></td>
<td>If ≥ 12, increase dose 0.02 mg/kg</td>
<td>29% increase dose 0.02 mg/kg</td>
</tr>
<tr>
<td><strong>Stabilize</strong></td>
<td>No increase for 48 hrs.</td>
<td>38% hold for 48 hrs.</td>
</tr>
<tr>
<td><strong>Wean</strong></td>
<td>10% of max dose daily</td>
<td>38% weaned by 10% daily</td>
</tr>
<tr>
<td><strong>Discharge</strong></td>
<td>48 hours off Morphine; 72 hours off Methadone</td>
<td>46% discharged 48 hrs. off drug</td>
</tr>
</tbody>
</table>
Improve Consistency in Modified Finnegan Scoring

- All sites use same tool

- Train RN staff to 90% reliability in scoring using D’Apolito Training System

- In Pilot work, we were able to see drop in max score when training completed

- OPQC has sent out DVD’s to each site
NAS Scoring by Clinical Staff

All fulltime nursing staff in our NICU complete the DAppolito NAS scoring training video

We test all fulltime nursing staff in our NICU to ensure the NAS scoring is in agreement with a standardized rater >90% of the time
The Scoring Tool suggested for use in the Ohio protocol can be found on the OPQC website ([https://opqc.net](https://opqc.net)) in addition to Worksheets that are helpful for tracking purposes.
Finnegan Scoring Tool
Why use an assessment tool?

- 2005 study: 81% centers surveyed use assessment tool, 52% have guidelines (Crocetti, Amin, & Janssonn, 2007)
- Allows for “common language”, decrease variability, involve families
- Based on opiate withdrawal
  - One tool for all substance withdrawal?
- Confounding factors
  - Term vs. preterm vs. beyond neonatal period
  - Staff training and competency maintenance
  - Subjectivity
# NAS Assessment Tools

<table>
<thead>
<tr>
<th>Scale</th>
<th>Finnegan Neonatal Withdrawal Inventory (NWI)</th>
<th>Neonatal Narcotic Withdrawal Index (NNWI)</th>
<th>Lipsitz</th>
<th>Ostrea</th>
</tr>
</thead>
</table>
| Developed | 1975  
| N DOL | Term newborns  
Up to DOL 28 | 80 Term newborns | 50 opiate exposed, term newborns, 24 hours old vs. 40 Term non-exposed newborns | 41 Newborns  
Gest Age 35-40 weeks | 196 Newborns  
Gest Age 37 weeks |
| Items Scored | 21 items  
Scale 1-5 | 7 items  
Scale 0-4 | 7 items +“other”  
Scale 0-2 | 11 items  
Scored 0-3 | 6 items  
Rank order |
| Type of withdrawal | Opiate | Opiate (Methadone, Heroin) | Opiate (Methadone, Heroin) | “narcotic addicted mothers” | Opiate (Methadone, Heroin) |
| Comments | Tx- two scores of 8+ or one 12+  
Comprehensive Complex  
Originally developed as clinical research tool  
Predominantly used in US | Tx- at score of 8  
Established inter-rater reliability, sensitivity, specificity | Tx- 2 scores 5+ in 24 hours  
Established reliability, inter-rater reliability | Highly subjective with yes/no and normal/abnormal answers  
Compared term and near term newborns to NAS | NO guidelines for therapy  
Not comprehensive |
“Modified Finnegan”

• Originally developed in 1975; “Modified” in 1986

• 200 term, opiate exposed newborns

• Assessed from the beginning of one feeding til the beginning of the next feeding, Q 3-4 hrs
  – Challenging with breastfed neonates

• Recommended: start scoring at 2 hours of age; if score= 8, continue to score Q2 hrs until less than 7

• OPQC treatment protocol: begin treatment for 2 consecutive scores of >8 or one score ≥12.
# Finnegan Scored Items

<table>
<thead>
<tr>
<th>Central Nervous System</th>
<th>Autonomic Nervous System</th>
<th>Gastrointestinal System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive Crying (2-3)</td>
<td>Sweating (1)</td>
<td>Excessive sucking (1)</td>
</tr>
<tr>
<td>Sleep (1-3)</td>
<td>Fever (1-2)</td>
<td>Poor feeding (2)</td>
</tr>
<tr>
<td>Hyperactive Moro (2-3)</td>
<td>Frequent Yawning (1)</td>
<td>Regurgitation (2)</td>
</tr>
<tr>
<td>Tremors (1-4)</td>
<td>Mottling (1)</td>
<td>Projectile Vomiting (3)</td>
</tr>
<tr>
<td>Increased muscle tone (2)</td>
<td>Nasal Stuffiness (1)</td>
<td>Stools (2-3)</td>
</tr>
<tr>
<td>Excoriation (1)</td>
<td>Sneezing (2)</td>
<td></td>
</tr>
<tr>
<td>Myoclonic jerks (3)</td>
<td>Nasal Flaring (2)</td>
<td></td>
</tr>
<tr>
<td>Convulsions (5)</td>
<td>Resp rate (1-2)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Central Nervous System</th>
<th>Autonomic Nervous System</th>
<th>Gastrointestinal System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive Crying (2-3)</td>
<td>Sweating (1)</td>
<td>Excessive sucking (1)</td>
</tr>
<tr>
<td>Sleep (1-3)</td>
<td>Fever (1-2)</td>
<td>Poor feeding (2)</td>
</tr>
<tr>
<td>Hyperactive Moro (2-3)</td>
<td>Frequent Yawning (1)</td>
<td>Regurgitation (2)</td>
</tr>
<tr>
<td>Tremors (1-4)</td>
<td>Mottling (1)</td>
<td>Projectile Vomiting (3)</td>
</tr>
<tr>
<td>Increased muscle tone (2)</td>
<td>Nasal Stuffiness (1)</td>
<td>Stools (2-3)</td>
</tr>
<tr>
<td>Excoriation (1)</td>
<td>Sneezing (2)</td>
<td></td>
</tr>
<tr>
<td>Myoclonic jerks (3)</td>
<td>Nasal Flaring (2)</td>
<td></td>
</tr>
<tr>
<td>Convulsions (5)</td>
<td>Resp rate (1-2)</td>
<td></td>
</tr>
</tbody>
</table>
Finnegan Training

Finnegan Training Courses (March-April 2010)

Two half day NAS Workshops
Train the trainer format

Implement standardized training of new staff with commercially produced program (NeoAdvances©)

Ongoing competency for all staff

**Reliability** = extent to which 2 providers agree when using the same tool.

**Method** = one person scores, while another observes; each independently scores, then compare

**Goal** = 90% inter-rater reliability
Main Campus A2 NICU = C4C NICU

**Specific Aim**

Increase the confidence level of the A2 NICU RN staff regarding Finnegan Scoring Tool/Inter-Observer Rater Reliability by 10% by August 31, 2013.

- Counter Balance Measure: maintain inter-rater reliability scores at greater than 90%

**Key Drivers**

- Staff confidence level with the use of Finnegan Scoring Tool
- Staff education and training of Finnegan Scoring Tool
- Staff inter-rater reliability scoring

**Design Changes / Interventions**

- Conduct pre and post surveys on staff confidence with use of Finnegan.

1) Staff education/training using “Assessing signs and symptoms of Neonatal Abstinence using the Finnegan Scoring Tool” video.
2) Scoring simulation
3) NAS Super Users for validation, ongoing support
4) Ongoing competency training

- Utilize Inter-Rater Reliability scoring minimally once every 12 hours to maintain reliability rates >90%
Ongoing Inter-rater Reliability

2013 Staff Survey on Finnegan Scoring:

• 67% of RN staff responded
• 15.2 % felt somewhat or not comfortable
  concerns: scoring of sleep for older babies, excoriation
• 37% wanted more education/training
• 26% of staff were not conducting inter-rater reliability scoring properly
Results

2013 all RNs watched: “Assessing signs and symptoms of Neonatal Abstinence using the Finnegan Scoring Tool” video from NeoAdvances

NAS Super Users reeducated all staff

Lunch n’ Learns with 2013 VON iNICQ NAS Webinars

Dual score minimally once every 12 hours with an NAS Super User or an NNP

2013 reliability scores = 98%
References

Questions

Please click on the raised hand icon on the right of your screen to ask a question OR type it into the chat box.
NAS Protocol
Non-Pharmacological and Pharmacological Bundles

Scott Wexelblatt, MD
Non-Pharmacologic Rx

- **Our NICU encourages swaddling, low stimulation for our NAS patients receiving non-pharmacological treatment:**
  - Not done currently: 96%
  - Planned: 4%
  - Implementing: 4%
  - Part of our practice: 0%

- **Our NICU encourages kangaroo care for our NAS patients receiving non-pharmacological treatment:**
  - Not done currently: 75%
  - Planned: 17%
  - Implementing: 4%
  - Part of our practice: 0%

- **Our NICU supports breast feeding (or express breast milk feeds) in infants with NAS:**
  - Not done currently: 67%
  - Planned: 8%
  - Implementing: 8%
  - Part of our practice: 21%

- **Our NICU feeds all formula fed infants with NAS lactose free formula on demand:**
  - Not done currently: 50%
  - Planned: 4%
  - Implementing: 4%
  - Part of our practice: 58%

- **Our NICU feeds all formula fed infants with NAS a 22 kcal/oz formula:**
  - Not done currently: 42%
  - Planned: 13%
  - Implementing: 0%
  - Part of our practice: 29%
Our NICU initiates pharmacologic treatment if NAS score is greater than 8 twice. Our NICU has a standardized Stabilization/Escalation Protocol for pharmacologic NAS Treatment. Our NICU initiates weaning of pharmacologic NAS treatment when NAS scores are stable for 48 hours. When weaning, our NICU decreases the dose of the treatment medication by 10% daily.
Non-Pharmacological Bundle

Key Driver:
Optimize Non-Pharmacologic Rx Bundle

Intervention:
• Swaddling, low stimulation.
• Encourage kangaroo care
• Feed on demand-
  • MBM if appropriate
  • lactose free
  • 22 cal formula
Non-Pharmacologic Treatments:

All infants with NAS will be treated with a bundle of non-pharmacologic interventions including decreased stimulation, swaddling, and continuous holding and frequent feeds.

Feedings:
- Each institution should develop a policy for the use of Mother’s Own Milk. Breast feeding may be given if the mother is active in a treatment program and mother’s addiction specialist supports breast feeding.

- If MBM is not used, consider frequent feeds with an increased caloric density low lactose formula at 22cal/oz. The higher calorie formula is designed to meet the exceptional caloric needs and combat the documented weight loss seen in NAS infants. This may reduce the amount of narcotic needed for treatment. Additional calories may not be needed once the infant is a week or more into the course and weight loss is < 10% of birth weight. 22 Calorie formula may be discontinued when weight gain is established firmly.
What are other hospitals testing?

“Steal Shamelessly-Share Seamlessly”

• Having the mother rooming-in with the infant.

• Involving Labor & Delivery nurses in non-pharmacological approach; specifically skin to skin contact.

• Cuddling Volunteer Programs for NAS infants.

• Primary Nurse assigned to infant for consistency of care; will this increase the use of non-pharmacological bundle?

• Testing which environment is best for infant (low stimulation).
Pharmacological Bundle

Key Driver:
Standardize NAS Treatment Protocol

Intervention:
• Initiate Rx if NAS score > 8 twice.
• Stabilization/ Escalation Phase
• Wean when stable for 48 hrs by 10% daily.

Source: https://neoadvances.org
Source: http://psychiatricnews.org
Pharmacologic Treatment

Treatment is divided into the following phases: **Initiation**, Escalation, Stabilization, Wean

**Morphine**

- Treatment should be initiated if an infant has 2 consecutive scores > 8 OR 1 score ≥ 12.
- **Initiation Phase** - most infants can be treated with oral medication. (**IV morphine and enteral morphine doses are not equivalent)**

<table>
<thead>
<tr>
<th></th>
<th>Morphine**</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>0.05mg/kg/dose q3h</td>
</tr>
<tr>
<td>IV</td>
<td>0.02 mg/kg/dose q3h</td>
</tr>
</tbody>
</table>

**Methadone**

- Treatment should be initiated if an infant has 2 consecutive scores > 8 OR 1 score ≥ 12
- **Initiation Phase** - all treatments are with oral medication

<table>
<thead>
<tr>
<th></th>
<th>Methadone</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>0.05mg/kg/dose q6h</td>
</tr>
</tbody>
</table>
Treatment is divided into the following phases:
Initiation, **Escalation**, Stabilization, Wean

**Morphine**

- **Escalation Phase:**

<table>
<thead>
<tr>
<th></th>
<th>Morphine</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>0.03mg/kg/dose q3h</td>
</tr>
<tr>
<td>IV</td>
<td>0.01 mg/kg/dose q3h</td>
</tr>
</tbody>
</table>

- **Increase dose every 3 hours** until controlled (average NAS ≤ 8 in 24 hours)

- **Rescue Dose:** If infant has 1 score of ≥ 12, double the previous dose given (enteral or IV) x 1 and then adjust accordingly:
  - **If NAS score now < 12:** make the scheduled maintenance dose (MD) the same as the rescue dose that was just administered. The first higher MD should be given at the next scheduled care/feed.
  - **If NAS score still > 12:** increase next dose by 50% of the prior dose. Continue to do so until score is < 12.

**Methadone**

- **Escalation Phase:**

<table>
<thead>
<tr>
<th></th>
<th>Methadone</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>0.1mg/kg/dose q6h</td>
</tr>
</tbody>
</table>

- **Increase dose** if NAS still > 8 after 3 doses of methadone

- If 3 doses later NAS still > 8 **increase** to 0.15 mg/kg/dose q6h
Treatment is divided into the following phases:
  Initiation, Escalation, Stabilization, Wean

**Second Drug: Phenobarbital**

**Consider adding Phenobarbital if:**

- **Polysubstance exposure** (benzodiazepines, barbiturates, antipsychotics, antidepressants, other sedatives/hypnotics, tobacco) is suspected/confirmed

- **AND** CNS findings (tremors, increased muscle tone, etc.) rather than GI findings predominate on NAS sub scale score

- **AND** Morphine dose exceeds 0.3 mg/kg/dose with score remaining > 8  **OR** Methadone dose exceeds 0.2 mg/kg/dose

- **OR** unable to wean for 2 consecutive days

**Loading dose:** 10 mg/kg/dose po q12hr x 2 doses PO  **OR** 20 mg/kg/ dose IV x1. (Enteral formulation contains 13% alcohol. Dividing dose PO may decrease risk of emesis and/or sedation.)

**Maintenance dose:** 5 mg/kg/dose po once daily (do not weight adjust)

**Phenobarbital Wean:** Two approaches may be used. (Neither has been directly studied.) Each center should pick one method.

- Discontinue when on second to last step of morphine or methadone wean to assess for tolerance of discontinuation. Given long half life of phenobarbital this will wear off gradually over 4 days.

- Discharging infant home on phenobarbital with subsequent weaning to be done either in Neo Clinic or by infant’s PCP. (Given the high alcohol concentration limiting exposure may be the best practice. Hypnotic or nicotine withdrawal occurs rapidly and generally is completed by day 5- thus longer phenobarbital exposure may not be needed.)
Pharmacologic Treatment
Treatment is divided into the following phases:
  Initiation, Escalation, Stabilization, Wean

Morphine AND Methadone Stabilization

- **Stabilization:**
  - All scores remain < 8 for minimum 48 hours.
  - 72 hours of stabilization may be used if infant has had to increase above 0.4 mg/kg dose or if phenobarbital added.
Treatment is divided into the following phases: Initiation, Escalation, Stabilization, Wean

Morphine Wean

• **Weaning Phase**: Once stabilized on same dose for 48 hours, use this dose as the starting point of the wean. **Begin weaning the dose by 10%** (of the original dose when the first wean was started) **every 24 hours**. Drug may be discontinued when a single dose is < 0.02 mg/kg/dose

• *Ad lib infants*: Infants should be allowed to ad lib feed but kept on q6hr drug schedule

• *Backslide*: If infant has 2 consecutive NAS scores >8, during the weaning process, assure that non-pharmacological measures are optimized (i.e.: swaddling, holding, decreased stimuli, etc.) before going back to previous dose at which patient was stable. If infant’s scores continue to be elevated (even after physical exam to ensure nothing else is wrong/bothering the infant), either weight adjust medication and/or continue to back up in a stepwise fashion until patient’s scores are ≤8. Once stabilized on new dose for minimum 48 hours, resume 10% wean but consider weaning at less frequent intervals.

• **Discharge**: Observe in-house x 48 hours off of morphine before discharge.
Treatment is divided into the following phases: Initiation, Escalation, Stabilization, Wean

**Methadone Wean**

- Once stabilized on same dose for 48 hours, use this dose as the starting point of the wean. (See example detail given in protocol posted on OPQC website)

- Begin wean back to 0.05mg/kg by weaning daily by 0.025 mg/kg/dose.

- *Ad lib infants*: Infants should be allowed to ad lib feed but kept on q6hr drug schedule

- *Backslide*: If infant has 2 consecutive NAS scores for >8, during the weaning process, assure that non-pharmacological measures are optimized before going back to previous dose at which patient was stable. If infant’s scores continue to be elevated either weight adjust medication and/or continue to back up in a stepwise fashion until patient’s scores are <8. Once stabilized on new dose for minimum 48 hours, resume wean but consider weaning at less frequent intervals.

- **Discharge**: Observe in-house x 72 hours off of methadone before discharge.
OCHA results from using the Ohio standardized protocol…
6 Pilot Sites - LOS

Opiate Treatment days
Day of Life of Discharge

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>102</td>
<td>183</td>
<td>187</td>
<td>29</td>
<td>32</td>
<td>14</td>
<td>547</td>
</tr>
</tbody>
</table>
Protocol vs No Protocol Used

Opiate Treatment Days
Day of Life of Discharge

N=77
No Protocol

N=476
Protocol
Methadone n= 224
Morphine n= 276

Day of life discharged
Days total opiate treatment

Morphine only
Methadone only
Total Morphine Dose Given (mg/kg)

No Protocol

Protocol

Total Morphine Dose Given
(mg/kg)
Total Methadone Dose Given (mg/kg)

No Protocol

Protocol
Treated with Phenobarbital

Morphine only

Methadone only

Treated with Phenobarbital
Impact of Ohio Weaning Protocol

Pilot Hospital 1

Consecutive Patients

Treatment (Days)

Pilot Hospital 1

New Protocol

Consecutive Patients

Treatment (Days)
Total treatment days

Day of life of discharge

Level 2  n=218
Level 3  n=330
Questions for Dr. Wexelblatt?

Please click on the raised hand icon on the right of your screen to ask a question OR type it into the chat box.
The Model for Improvement

Heather Kaplan, MD
Knowledge for Improvement

Learn to combine subject matter knowledge and profound knowledge in creative ways to develop effective changes for improvement.
Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

Act

Plan

Study

Do

AIM
Aim Statement

What are we trying to accomplish?

S - Specific
M - Measurable
A – Actionable
R – Relevant
T – Time bound
NAS Aim

By increasing identification of and compassionate withdrawal treatment for full-term infants born with Neonatal Abstinence Syndrome (NAS), we will reduce length of stay by 20% across participating sites by June 30, 2015.
Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

Act | Plan
---|---
Study | Do

KEY DRIVER DIAGRAM: MEASURES CHANGES
Key Driver Diagram

• A diagram that organizes the “theory of improvement” for a specific QI project
• Makes the theory (and plan for execution) explicit
• Connects the aim (outcome), key drivers & changes
  – Identifying the key drivers helps focus the selection of changes to test
  – Guides selection of key outcome and process measures
  – Helps tie smaller QI projects to a larger global aim
• Creates a “Learning Structure” that helps communicate the theory about how changes will result in improvement

**GLOBAL AIM**

To reduce the number of moms and babies with narcotic exposure, and reduce the need for treatment of NAS.

**SMART AIM**

By increasing identification of and compassionate withdrawal treatment for full-term infants born with Neonatal Abstinence Syndrome (NAS), we will reduce length of stay by 20% across participating sites by June 30, 2015.

**KEY DRIVERS**

- Prenatal Identification of Mom
- Implement Optimal Med Rx Program
- Improve recognition and non-judgmental support for Narcotic addicted women and infants
- Attain high reliability in NAS scoring by nursing staff
- Optimize Non-Pharmacologic Rx Bundle
- Standardize NAS Treatment Protocol
- Connect with outpatient support and treatment program prior to discharge
- Partner with Families to Establish Safety Plan for Infant
- Partner with other stakeholders to influence policy and primary prevention.

**INTERVENTIONS**

- All MD and RN staff to view “Nurture the Mother- Nurture the Child”
- Monthly education on addiction care
- Fulltime RN staff at Level 2 and 3 to complete D’Apolito NAS scoring training video and achieve 90% reliability.
- Swaddling, low stimulation
- Encourage kangaroo care
- Feed on demand- MBM if appropriate or lactose free, 22 cal formula
- Initiate Rx If NAS score > 8 twice.
- Stabilization/ Escalation Phase
- Wean when stable for 48 hrs by 10% daily.
- Establish agreement with outpatient program and/or Mental Health
- Utilize Early Intervention Services
- Collaborate with DHS/ CPS to ensure infant safety.
- Engage families in Safety Planning.
- Provide primary prevention materials to sites.
NAS Measures

• **Primary Outcome Measure**
  – Length of Stay

• **Other Outcome Measures**
  – Length of treatment with opiate replacement
  – # of mothers with antepartum narcotic use (Medicaid Data)
  – # of infants with NAS (Medicaid Data)

• **Process Measures**
  – Adherence to the Non-Pharmacologic Rx Bundle
  – Adherence to the Pharmacologic Treatment Protocol
  – % of infants with NAS requiring pharmacologic treatment

• **Balancing Measure**
  – Readmissions within 28 days (Medicaid Data)
Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

Act → Plan → Study → Do
What is a test?

Putting a change into effect on a temporary basis and learning about its impact.
Why Test?

1. To reduce the risk/cost of implementing an intervention → testing provides an opportunity to learn without severely impacting performance
2. To increase (or decrease) your belief that the change will result in improvement
3. To learn how to adapt the change to other conditions in your environment
4. To minimize resistance to implementation
What is Not a Test?

• Data collection
• Implementing a solution
• Rolling out an educational program
• Getting a form, policy, procedure approved by the official committees
PDSA Cycles

• PDSA Cycles help us execute true tests by helping QI teams:
  – Think small
  – Develop detailed plans to execute the tests of change (who, when, where…)
  – Be methodical and make predictions
  – Allow rapid adaptation and implementation of changes in busy healthcare settings
Key Points for PDSAs

1. Do initial PDSAs on smallest scale possible
   – A “cycle of one” usually best
   – “Failed” cycles are good learning opportunities, particularly when small

2. As move to implementation, test under as many conditions as possible
   – Think about factors that could lead to breakdowns, supports needed, “naysayers”
Key Points for PDSAs (cont’d)

3. Always identify the prediction or hypothesis before testing the change
   – Allows improved learning from “failures” and refinement of your theory

4. Use a “study measure” specific to the PDSA
   – Usually not one of the project measures
   – Usually not collected beyond the PDSA cycle
   – Qualitative results are very valuable in early PDSAs
Smaller Scale Tests

<table>
<thead>
<tr>
<th>YEAR</th>
<th>QUARTER</th>
<th>MONTH</th>
<th>WEEK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>DAY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HOUR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MINUTE</td>
</tr>
</tbody>
</table>

Drop down “two levels” below wherever you initially planned a PDSA
Smaller Scale Tests: The Power of “one”

Conduct the test with

• one day
• one physician
• one patient
## Appropriate Scope PDSA Cycles

<table>
<thead>
<tr>
<th>Current Situation</th>
<th>Staff Readiness to Make Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resistant</td>
</tr>
<tr>
<td><strong>Low Confidence that current change idea will lead to improvement</strong></td>
<td></td>
</tr>
<tr>
<td>Cost of failure large</td>
<td>Very Small Scale Test</td>
</tr>
<tr>
<td>Cost of failure small</td>
<td>Very Small Scale Test</td>
</tr>
<tr>
<td><strong>High Confidence that current change idea will lead to improvement</strong></td>
<td></td>
</tr>
<tr>
<td>Cost of failure large</td>
<td>Very Small Scale Test</td>
</tr>
<tr>
<td>Cost of failure small</td>
<td>Small Scale Test</td>
</tr>
</tbody>
</table>
# PDSA: Testing Effects of Maternal Empowerment Program

<table>
<thead>
<tr>
<th>Objective for this series of tests</th>
<th>Determine whether teaching mothers non-pharmacologic treatment strategies for NAS at the time of NICU admission will reduce need for pharmacologic treatment</th>
</tr>
</thead>
</table>
| Applicable Key Drivers             | 1. Optimize Non-Pharmacologic Rx Bundle  
2. Improve recognition and non-judgmental support for Narcotic addicted women and infants |
| Overall Population                 | Mother and Infants with NAS |
| **TEST CYCLE 1**                   | **Start Date:** 5/10 | **End Date:** 5/17 |
| Test Population                    | One mother of an infant with NAS already admitted to the NICU |
| **Plan**                           | **Tasks:**  
1. QI Team develops curriculum by reviewing OPQC Non-Pharmacologic Bundle  
2. QI Team creates draft materials to help mothers learn to recognize stress and withdrawal signs, to learn soothing techniques, and appropriate swaddling  
3. QI team identifies a willing mother with an infant with NAS in the NICU and reviews materials with her  
4. Mom demonstrates skills with her own infant  
**Measures:**  
1. Qualitative feedback from mother about the teaching materials and curriculum  
2. QI Team assessment of mother’s effectiveness demonstrating skills learned during the curriculum on her own infant (swaddling, soothing). |
| **Prediction**                     | Teaching program will be acceptable to mothers and will result in increased knowledge for mothers and more effective infant soothing behaviors |
| **Do**                             | Test conducted as planned |
| **Study**                          | Mother appreciated the teaching. She did not obtain a good understanding of the types of behaviors to watch for in the infant. She was able to demonstrate appropriate swaddling and soothing techniques. |
| **Act**                            | Adapt curriculum. Test with another family. |
**TEST 1**
*What*: Curriculum Development
*Who (population)*: 1-2 Mothers of infants with NAS and QI team
*Where*: NICU
*When*: From: 5/10 To: 5/17
*MEASURE*: Qualitative feedback, skill demonstration

**TEST 2**
*What*: Curriculum Refinement
*Who (population)*: Small sample of mothers of infants with NAS with bedside nurses
*Where*: NICU
*When*: From: 5/17 To: 6/3
*MEASURE*: skill demonstration, pre/post knowledge assessment

**TEST 3**
*What*: Curriculum efficacy
*Who (population)*: 5 Methadone program mothers/infants with bedside nurses
*Where*: NICU
*When*: From: 6/3 To: 6/24
*MEASURE*: skill demonstration, percent of infants with Finnegan scores initiated who needed pharmacologic treatment (expected improvement: decrease)

**TEST 4**
*What*: Curriculum efficacy
*Who (population)*: All NAS infants and their mothers with bedside nurses
*Where*: NICU
*When*: From: 6/24 To: ???
*MEASURE*: percent of infants with Finnegan scores initiated who needed pharmacologic treatment (expected improvement: decrease)
Questions for Dr. Kaplan

Please click on the raised hand icon on the right of your screen to ask a question OR type it into the chat box.
PDSA Worksheet

https://opqc.net/teams/quality-improvement-resources

Plan

Do

Act

Study

PDSA WORKSHEET

Team Name: ___________________________ Date of test: ___________________________

Overall team/project aim: ___________________________ Test Completion Date: ___________________________

What is the objective of the test?

PLAN:

Briefly describe the test:

How will you know that the change is an improvement?

What driver does the change impact?

What do you predict will happen?

List the tasks necessary to complete this test (what)  Person responsible (who)  When  Where

1. ___________________________ ___________________________ ___________________________ ___________________________

2. ___________________________ ___________________________ ___________________________ ___________________________

3. ___________________________ ___________________________ ___________________________ ___________________________

4. ___________________________ ___________________________ ___________________________ ___________________________

5. ___________________________ ___________________________ ___________________________ ___________________________

6. ___________________________ ___________________________ ___________________________ ___________________________

Plan for collection of data:

DO: Test the changes.

Was the cycle carried out as planned?  Yes  No

Record data and observations.

What did you observe that was not part of our plan?

STUDY:

Did the results match your predictions?  Yes  No

Compare the result of your test to your previous performance:

ACT: Decide to Adopt, Adapt, or Abandon.

☐ Adopt: Improve the change and continue testing plan. Plans/changes for next test:

☐ Adapt: Select changes to implement on a larger scale and develop an implementation plan and plan for sustainability

☐ Abandon: Discard this change idea and try a different one
IRB Update

• After verbal discussion with the CCHMC IRB, there is a strong likelihood that the OPQC NAS project will be considered "Not Human Subjects Research". OPQC will submit the paperwork for this.

• Two things can happen:
  • If, after review of submission, we receive confirmation of "Not Human Subjects Research", we will provide all NAS teams with the official IRB letter for their own files, which should preclude the need for sites to obtain IRB approval.
  
• If we do not receive a “Not Human Subjects Research” determination, then sites can do one of the following:
  • Sites may apply to their local IRB (and OPQC will provide a template application) as they may have already done--or
  • Sites may opt to sign an authorization agreement that allows CCHMC to be the IRB of record
The **Lead Physician** is responsible for engaging the site in the following activities:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>Lead Physician leads the implementation of the Ohio Perinatal Quality Learning Collaborative (OPQC) core changes at your site for the duration of the project.</td>
</tr>
<tr>
<td>Monthly Progress Report</td>
<td>Site has a 75% completion rate (i.e. 9/12 months)</td>
</tr>
<tr>
<td>Data</td>
<td>Site has a 90% data submission rate (i.e. 11/12 months)</td>
</tr>
<tr>
<td>Learning Sessions</td>
<td>MD/Team representation at ALL Learning Sessions</td>
</tr>
<tr>
<td>Action Period Calls</td>
<td>Team representation at 75% of AP Calls (i.e. 9/12 months)</td>
</tr>
</tbody>
</table>

**Team Physician:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting Attendance</td>
<td>Attend <strong>four or more</strong> project meetings (this can be OPQC calls or local staff or QI meetings or specific unit meetings re: the project) that review team data and improvement efforts.</td>
</tr>
<tr>
<td>Patient Care</td>
<td>Provide direct or consultative patient care in this improvement project.</td>
</tr>
<tr>
<td>Quality Improvement</td>
<td>Complete one or more tests of change.</td>
</tr>
<tr>
<td>Data</td>
<td>Review the team’s data during the project (this can occur through staff or QI meetings or specific unit meetings).</td>
</tr>
<tr>
<td>Participation</td>
<td>Participate actively in the project to support the improvement efforts (for the project duration).</td>
</tr>
</tbody>
</table>
Registration Opens Today!

The OPQC Summer 2014 Learning Session will be on Thursday, June 26\textsuperscript{th} at the Ohio Union-OSU in Columbus.
Additional Questions?

Please click on the raised hand icon on the right of your screen to ask a question OR type it into the chat box.
Next Steps

Review Homework –

• Complete your team’s AIM statement

• Review the D’Apolito Scoring Tool DVD’s. Plan PDSA for implementation of staff scoring reliability.

• Review YOUR Unit Protocol with that of the Ohio NAS Protocol. What element might you want to test in your Unit/Nursery?

• Next Action Period Call: June 3, 2014

Follow us on Twitter: @OhioPQC
Resources

- OPQC web site: https://opqc.net
- OPQC email: opqc@cchmc.org
- Twitter account: @OhioPQC

- Susan Ford, RN
  BEACON Quality Improvement Coordinator
  - susan.ford@UHhospitals.org

- Kate Haralson, MPH
  Project Specialist
  - opqc@cchmc.org
The OPQC NAS Project is funded by The Ohio Department of Medicaid