EAT, SLEEP, CONSOLE: THE COLORADO EXPERIENCE

NAS Initiative Webinar
February 19, 2019
Welcome!

• Please enter your Audio PIN on your phone so we can un-mute you for discussion

• If you have a question, please enter it in the Question box or Raise your hand to be unmuted

• This webinar is being recorded

• Please provide feedback on our post-webinar survey
No qualifying cases for the month?

Please press “No” in the e-mail we send to you each month and complete the form in REDCap.

---

Dear NAS participating hospital,

Do you have any NAS infant to report for this past month? – Click below

[YES] [NO]
NQC – Complete the REDCap form
Colorado Hospitals
Substance Exposed Newborn Quality Improvement Collaborative (CHoSEN QIC)

February 19, 2019
Among 28 states, overall NAS incidence increased 300% from 1.5 to 6.0 per 1000 hospital births from 1999 to 2013.

Primary Outcome: Newborn treatment with pharmacotherapy

Secondary Outcomes: LOS, inpatient cost, harms from treatment (in-hospital adverse events and readmission rates)
Figure 2. Rooming-in vs Usual Care on the Need for Pharmacotherapy

<table>
<thead>
<tr>
<th>Source</th>
<th>Year</th>
<th>No. of Events</th>
<th>Total No.</th>
<th>No. of Events</th>
<th>Total No.</th>
<th>Risk Ratio (95% CI)</th>
<th>Favors Rooming-in</th>
<th>Favors Comparison Group</th>
<th>Weight, %</th>
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<td>2013</td>
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<td>24</td>
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<td>0.89 (0.71-1.12)</td>
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<td>2016</td>
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<td>20</td>
<td>20</td>
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<td>18</td>
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<td>0.25 (0.06-0.95)</td>
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<td><strong>Total</strong></td>
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<td><strong>51</strong></td>
<td><strong>186</strong></td>
<td><strong>186</strong></td>
<td><strong>266</strong></td>
<td><strong>0.37 (0.19-0.71)</strong></td>
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Heterogeneity: $\tau^2 = 0.51$; $I^2 = 85\%$
Test for overall effect $z = 2.99$; $P = .003$
Figure 3. Rooming-in vs Usual Care on Length of Stay

<table>
<thead>
<tr>
<th>Source</th>
<th>Rooming-in</th>
<th>Mean</th>
<th>SD</th>
<th>Total</th>
<th>Comparison Group</th>
<th>Mean</th>
<th>SD</th>
<th>Total</th>
<th>Mean Difference (Days), Random, (95% CI)</th>
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<tr>
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<td>11.8</td>
<td>9.1</td>
<td>32</td>
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<td>24.7</td>
<td>22.2</td>
<td>74</td>
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<td>22.4</td>
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<td>48</td>
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<td>10.0</td>
<td>7.5</td>
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<td>-3.30 (-5.63 to -0.97)</td>
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<td>15.3</td>
<td>53</td>
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<td>-6.20 (-12.00 to -0.40)</td>
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<td>2.2</td>
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<td>-19.00 (-26.85 to -11.15)</td>
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<td>17.9</td>
<td>42</td>
<td></td>
<td>-3.90 (-15.17 to 7.37)</td>
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<tr>
<td>Total (95% CI)</td>
<td>186</td>
<td></td>
<td>302</td>
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<td></td>
<td>-10.41 (-16.84 to -3.98)</td>
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</tbody>
</table>

Heterogeneity: $\tau^2 = 54.31%; I^2 = 91%$

Test for overall effect $z = 3.17; P = .002$

An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome

Matthew R. Grossman, MD, Adam K. Berkwitt, MD, Rachel R. Osborn, MD, Yaqing Xu, MS, Denise A. Esserman, PhD, Eugene D. Shapiro, MD, Matthew J. Bizzarro, MD

BACKGROUND AND OBJECTIVES: The incidence of neonatal abstinence syndrome (NAS), a constellation of neurologic, gastrointestinal, and musculoskeletal disturbances associated with opioid withdrawal, has increased dramatically and is associated with long hospital stays. At our institution, the average length of stay (ALOS) for infants exposed to methadone in utero was 22.4 days before the start of our project. We aimed to reduce ALOS for infants with NAS by 50%.

METHODS: In 2010, a multidisciplinary team began several plan-do-study-act cycles at Yale New Haven Children’s Hospital. Key interventions included standardization of nonpharmacologic care coupled with an empowering message to parents, development of a novel approach to assessment, administration of morphine on an as-needed basis, and transfer of infants directly to the inpatient unit, bypassing the NICU. The outcome measures included ALOS, morphine use, and hospital costs using statistical process control charts.
FIGURE 1
Key driver diagram for NAS quality improvement project.
Quality improvement initiative to improve inpatient outcomes for Neonatal Abstinence Syndrome

Elisha M. Wachman¹ · Matthew Grossman² · Davida M. Schiff¹,³ · Barbara L. Philipp¹ · Susan Minear¹ · Elizabeth Hutton¹ · Kelley Saia⁴ · FNU Nikita⁵ · Ahmad Khattab⁶ · Angela Nolin⁶ · Crystal Alvarez⁵ · Karan Barry¹ · Ginny Combs¹ · Donna Stickney¹ · Jennifer Driscoll¹ · Robin Humphreys¹ · Judith Burke¹ · Camilla Farrell⁷ · Hira Shrestha¹ · Bonny L. Whalen⁸
## Table 2  Demographics and outcomes pre- and post-intervention

<table>
<thead>
<tr>
<th>Demographic/outcome</th>
<th>Pre-intervention N=101</th>
<th></th>
<th>Post-intervention N=85</th>
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<tr>
<td></td>
<td>N (%) or Mean (95% CI)</td>
<td>p</td>
<td>N (%) or Mean (95% CI)</td>
<td>p</td>
</tr>
<tr>
<td><strong>NAS outcomes</strong></td>
<td></td>
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<tr>
<td>Pharmacologic treatment</td>
<td>88 (87.1%)</td>
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<td>34 (40.0%)</td>
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<tr>
<td>Adjunctive medication&lt;sup&gt;d&lt;/sup&gt;</td>
<td>34 (33.6%)</td>
<td></td>
<td>2 (2.4%)</td>
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<tr>
<td>Hospital LOS—all opioid-exposed infants (days)</td>
<td>17.4 (15.8, 19.0)</td>
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<td>11.3 (10.0, 12.6)</td>
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</tr>
<tr>
<td>Pharmacologically treated LOS (days)</td>
<td>19.1 (17.5, 20.7)</td>
<td></td>
<td>17.6 (16.5, 18.7)</td>
<td>0.11</td>
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<tr>
<td>Opioid treatment days</td>
<td>16.2 (14.5, 17.9)</td>
<td></td>
<td>12.7 (11.5, 13.8)</td>
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<tr>
<td>Caregiver presence (%)</td>
<td>55.6% (50.3%, 60.8%)</td>
<td></td>
<td>79.9% (74.8%, 85.1%)</td>
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<tr>
<td>Parental presence (%)</td>
<td>55.6% (50.3%, 60.8%)</td>
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<td>75.8% (69.8%, 81.8%)</td>
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<tr>
<td>Cuddler presence (%)</td>
<td>—</td>
<td></td>
<td>4.4% (3.2%, 5.5%)</td>
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<tr>
<td>Hospital charges (US dollars)</td>
<td>31,825 (28,898, 34,751)</td>
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<td>20,668 (18,290, 23,045)</td>
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<tr>
<td>Re-admission&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0</td>
<td></td>
<td>1 (1.2%)</td>
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</table>

<sup>d</sup> Indicates a significant difference at p < 0.05.
B

**Percent of infants pharmacologically treated**

- Non-Pharm Care Bundle
- Symptom prioritization
- Parental education

---

% Treated  Average  UCL and LCL

- ESC Care Tool
- Cuddlers

- Mean 83.2%
- Mean 40.8%

**Month of admission**


Wachman et al. Jour of Perinatology 2018
CHoSEN QIC

Initiative Goal

Our goal is to develop a collaborative quality improvement initiative of Colorado hospitals that will use structured quality improvement methods and sharing of data and practices to further support hospital-based improvement efforts to achieve measurable improvements in the care of substance-exposed newborns and their families.
Overall Project Goal
Improve the care and outcomes of SENs.

1. Improve the hospital-based care of SENs.
2. Improve the safe discharge of SENs.

Primary Aims

Primary Drivers

- Increase and improve participation of CO hospitals in improvement project
  - **Measure:** % of CO birth hospitals engaged in project

- Reduce post-natal exposure to opiates
  - **Outcome Measure:** % of SENs at risk for NAS needing pharmacologic Rx
  - **Process Measure:** % of SENs receiving non-pharmacologic care

- Increase family involvement in care

- Improve discharge process for SENs

Secondary Drivers

- Increase number of hospitals that have structured and effective care guidelines of the SEN
  - **Measure:** % of hospitals in project with active SEN QI project by end of 2018
  - **Measure:** % of hospitals in project reporting data to collaborative database by 2018

- Improve non-pharmacologic care
  - **Process Measure:** % of SENs receiving non-pharmacologic care

- Implement ESC assessment tool
  - **Process Measure:** % of participating hospitals utilizing the ESC assessment tool

- Increase antenatal consults for families with SEN
  - **Measure:** % of hospitals with protocol/guidelines for prenatal consultation

Potential Change Concepts

1. Outreach to CO hospitals
2. QI education and project facilitation
3. Database development including completion of Data Use Agreements

- Increase use of human milk
  - **Process Measure:** % of participating hospitals with a policy on use of mother’s own milk

- Standardize the discharge process for SENs
  - **Measure:** % of hospitals with a guideline for safe discharge of SENs

1. Development of local protocols
2. Staff education

- Measure: % of hospitals in project with protocol/guidelines for prenatal consultation
Progress to Date
Development of Partnerships
September 2017

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Team Lead Identified</th>
<th>Team Roster Completed</th>
<th>IRB Review Completed</th>
<th>Data Audit Begun</th>
<th>Interventions Implemented</th>
<th>Data Sharing Begun</th>
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<td>Hospital</td>
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<td>Team Roster Completed</td>
<td>Data Use Agreement</td>
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<td>Data Collection &amp; Sharing Begun</td>
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Workshops, Forums, Webinars

- First forum, September 2017
- Fall Forum, November 2017
- CHoSEN QIC “How-To” Workshop, February 2018
- Spring Forum, May 2018
- Webinar, September 2018
- Winter Forum, January 2019
Over 80 attendees from across Colorado:

- Colorado Springs
- Denver Metro
- Fort Collins
- Grand Junction
- Glenwood Springs
- Greeley
- Pueblo

Representing:

- 14 Colorado hospitals
- 3 State agencies
- 3 Partner organizations
## Site Visits

<table>
<thead>
<tr>
<th>Hospital</th>
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<td>Denver Health</td>
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<td>Valley View Hospital</td>
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<td>St. Mary’s Medical Center</td>
<td>11/20/2018</td>
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<td>Parkview Medical Center</td>
<td>1/14/2019</td>
</tr>
<tr>
<td>St. Joseph Hospital</td>
<td>2/15/2019</td>
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Data Update
315 cases captured to date
Cases of Substance-exposed Newborns by Mother's Ethnicity

- Not Hispanic, 183
- Hispanic, 109
- Unknown, 29
Cases of Substance-exposed Newborns by Mother's Insurance

- Public/Medicaid, 282
- Private, 22
- Unknown, 8
- Self-pay, 5
- Combination, 2
Maternal and Fetal Exposures by Type of Substance

- Heroin
- Amphetamines
- Methadone, prescribed
- Nicotine
- Marijuana
- Buprenorphine, prescribed
- Other opioids, prescribed
- Other opioids, illicit
- Cocaine
- Alcohol
- Benzodiazepine
- Unable to determine
- Other
- SSRI
- Methadone, unknown source
- Buprenorphine, illicit
- Buprenorphine, unknown source
- Methadone, illicit
Median Length-of-Stay

Neonates born under 35-0 weeks gestation and neonates transferred to another facility were excluded from the data.
Percent of Substance-exposed Newborns Who Were Eligible for Mother's Own Milk Based on Hospital's Guidelines

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<th>Quarter</th>
<th>Percentage</th>
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<td>Q3 2017</td>
<td>44%</td>
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<td>Q4 2017</td>
<td>39%</td>
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<td>Q1 2018</td>
<td>49%</td>
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<td>Q2 2018</td>
<td>31%</td>
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<tr>
<td>Q3 2018</td>
<td>51%</td>
</tr>
<tr>
<td>Q4 2018</td>
<td>47%</td>
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</table>
Percent of Substance-exposed Newborns Who Received Mother's Own Milk (MOM) if Eligible

<table>
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<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>Qua3 2017</td>
<td>88%</td>
</tr>
<tr>
<td>Qua4 2017</td>
<td>78%</td>
</tr>
<tr>
<td>Qua1 2018</td>
<td>86%</td>
</tr>
<tr>
<td>Qua2 2018</td>
<td>73%</td>
</tr>
<tr>
<td>Qua3 2018</td>
<td>89%</td>
</tr>
<tr>
<td>Qua4 2018</td>
<td>83%</td>
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</table>
Cases were excluded from denominator if use of non-pharm therapy was unknown. Nearly all cases in Qua1 2018 where non-pharm therapy was not initiated prior to opiate treatment were for one hospital that joined CHoSEN during that quarter.
Percent of Neonates Receiving Opiate Treatment

<table>
<thead>
<tr>
<th>Quarter</th>
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<tr>
<td>Qua3 2017</td>
<td>60%</td>
</tr>
<tr>
<td>Qua4 2017</td>
<td>55%</td>
</tr>
<tr>
<td>Qua1 2018</td>
<td>50%</td>
</tr>
<tr>
<td>Qua2 2018</td>
<td>45%</td>
</tr>
<tr>
<td>Qua3 2018</td>
<td>40%</td>
</tr>
<tr>
<td>Qua4 2018</td>
<td>45%</td>
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One Colorado Hospital
Based on the data, what next?
CHoSEN QIC Next Steps

• Move beyond birth hospitalization
  • Focused effort on understanding and improving prenatal counseling of mothers (Parkview Medical Center)

• Qualitative interviews of mothers, hospital staff, and outpatient providers about their experiences in caring for opioid exposed newborns

• Increase hospital participation in CHoSEN QIC within and beyond Colorado
Barriers (or Opportunities)

• Physical and conceptual separation of the maternal-infant dyad
• Lack of linked data systems
  • Mother - Infant
  • Prenatal - Birth Hospitalization – Postnatal Care
  • Hospital care - social service utilization
  • Maternal medical care – Mental health care – SUD Treatment
“Isolation is the Enemy of Improvement.”
Acknowledgements

Illuminate Colorado
Jillian Adams
Jade Woodard

CPCQC
Jaime Cabrera
Nancy Griffith
Rachel Wright

CHoSEN QIC Steering Committee
Ann Hall
Susan Hwang
Jessica Scott
Danielle Smith
Colleen Wheeler
Erica Wymore

Funders
Colorado Office of the Attorney General
COPIC
Colorado Medicaid UPL

Hospitals
- Denver Health
- Lutheran Medical Center
- McKee Medical Center
- Medical Center of the Rockies
- Memorial Hospital
- North Colorado Medical Center
- North Suburban Medical Center
- Parkview Medical Center
- Parker Adventist
- Platte Valley
- Poudre Valley
- San Luis Valley Health
- St. Joseph Hospital
- St. Mary’s Medical Center
- St. Vincent Healthcare
- University Hospital
- Valley View Hospital
ESC 101: Practical tips for Implementation

Colleen Wheeler, PA-C
CHoSEN QIC Committee Member
February 19, 2019
KEYS TO IMPLEMENTATION

• Team Development
• Hospital support
• Team training
• Monitoring impact
NAS/ESC COMMITTEE

• Multidisciplinary NAS committee
  • Nurses, Physicians, NNPs, pharmacists, social workers, OB providers
• Team champions identified
• Goals
• QI efforts (Smart AIM statement)
• Collaboration
  • Ideally among nurse champions from area hospitals
IDEAL GOALS OF QI EFFORT

• Engage with mothers affected by SUD during prenatal period
• Fully support normal newborn behavior
• Treat less infants with opioids
• Empower families to take care of their infants
TRAINING

• Participate in ESC webinar/attend informational sessions
• Educate ALL staff on ESC methods
  • Create brief PowerPoint/other resources for general information
• Provide training on ESC assessment methods to appropriate providers
  • Bedside nursing, neonatologists and pediatricians caring for infants with NAS
NURSING EDUCATION

• Goal is to train all nurses and providers
• Assign learning modules with training videos followed by case study and quiz (aim for 80% accuracy)
• Give fast talks to explain current practices and rationale for new approach
• Make learning materials widely available
ESC TRAINING VIDEO

- Describes each component of ESC care assessment tool
- Reviews non-pharm care
- Reviews when team huddle is necessary
- Includes case study/quiz
HOSPITAL SYSTEMS/SUPPORT

• Team champions obtain support from hospital administration for improving care to families affected by Substance Use Disorder

• Create appropriate system in EMR to allow for ESC documentation

• Modify appropriate policies and guidelines to incorporate ESC assessment
  • Should apply to both well baby nursery and NICU
MONITORING IMPACT

• Data Collection
  • Participate in data system such as Red Cap
  • Include past data if available

• Post implementation survey to all nursing staff/providers
  • Monitor staff preparedness and successes/challenges of ESC at your hospital
IMPLEMENTATION GUIDELINE

• NAS team leads and nurse champions identified
• Collaboration with all well baby/NICU providers, pharmacists, nurse educators
• Allow ~ 6 months for full implementation
ESC Implementation at Denver Health

August 2016
- Multidisciplinary committee formed
  - MDs, APPs, RNs, Nurse educators, Pharmacist, social work
  - Focus on prenatal education-parenting class, emphasized non pharm care

July 2017
- Joined state wide collaborative to improve care to SENs
  - Commitment to implement ESC

October 2017
- Collaboration with NeoQIC Massachusetts for ESC tool and education resources

January 2018
- ‘Go Live’ with ESC Assessment tool; no longer using Finnegan to assess/guide treatment of SEN infants
OTHER CONSIDERATIONS

• Important to emphasize complete culture change
• Important to have ongoing prenatal education emphasizing non-pharm care.
• Where will substance exposed newborns stay?? NBN? Level II unit? Peds ward?
• Consider use of cuddlers or other caregivers while parents are away
• Perform CQI (e.g. PDSA cycle)
It Takes A Village

A NICU cuddler helps out while parents are away
THANK YOU FOR YOUR ATTENTION
USING STANDARDIZED MEASUREMENT TOOLS IN NAS

Maya Balakrishnan & Karen Fugate
Standardized measurement tools

- Assist with data collection

And many more benefits...

- Supports standardization
- Helps communicate current practice
- Ensure practice is easily understood
- Process becomes repetitive and cyclical
- Baseline for improvement
**Weaning opportunities**

<table>
<thead>
<tr>
<th>EACH weaning opportunity correct</th>
<th>Yes</th>
<th>No</th>
<th>Documentation inconclusive</th>
<th>No wean before initial disposition</th>
</tr>
</thead>
</table>

**Note:**
- Fill in the weaning opportunity for each infant. This form is designed to track weaning opportunities and compliance with clinical guidelines.
Weaning opportunities

Weaning Opportunities Documentation Form

<table>
<thead>
<tr>
<th>Date (MM/DD/YY)</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
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</thead>
<tbody>
<tr>
<td>Finnegan scores (min-max)</td>
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<td>Wean</td>
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<td>If WEANED by</td>
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<td>If NOT WEANED, why?</td>
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<td>A: Scores too high.</td>
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<td>B: Not gaining weight well.</td>
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<td>C: Physician discomfort.</td>
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<td>D: Nurse discomfort.</td>
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<td>E: Patient discomfort.</td>
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</table>

After several PDSA cycles...

<table>
<thead>
<tr>
<th>Date (MM/DD/YY)</th>
<th>Mon</th>
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<td>Was Methadone initiation indicated? 2 consecutive scores &gt;8 or any score &gt;12)</td>
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<td>If Methadone indicated and not initiated—please indicate the reason</td>
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<td>Weaned?</td>
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</tbody>
</table>

Methadone initiation reasons: 1: Infant easily consoled on my exam 2: Parental reason 3: Other—please specify

Rooming-in hours

| Rooming-in (# of days where a caregiver was present for at least 6 hours per day): | days |
Rooming-in hours

NAS Project: Rooming-in Data Collection Tool

Record estimated number of hours each shift that parent, any family member or friend, or cuddler spent with baby.

<table>
<thead>
<tr>
<th>Date</th>
<th>7A-7P hours</th>
<th>7P-7A hours</th>
<th>Total hours</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Patient’s name ___________________________ Patient’s MRN ___________________________

Rooming-in Data Collection Tool

Record the estimated number of hours each shift that the parent, any family member, friend, cuddler, or any other caregiver spent with baby. This can include time outside of holding that they were in the room with the baby.

DATE: ____________

7am-7pm Nurse: NICU Staff Nurse OR Float Nurse
7pm-7am Nurse: NICU Staff Nurse OR Float Nurse

<table>
<thead>
<tr>
<th>SHIFT</th>
<th>PARENT</th>
<th>FAMILY MEMBER</th>
<th>BEDSIDE RN</th>
<th>OT / PT / Speech</th>
<th>CUDDLER</th>
<th>OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7A-7P</td>
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</tr>
<tr>
<td>7P-7A</td>
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</table>

After several PDSA cycles...
If you have a question, please enter it in the Question box or Raise your hand to be un-muted.

We can only unmute you if you have dialed your Audio PIN (shown on the GoToWebinar side bar).
Save the Date: April 4-5, Tampa
FPQC 2019 Conference

Racial/ethnic disparities in maternal mortality & morbidity – Elizabeth Howell, MD, MPP
Professor of Population Health Sciences & Policy, Obstetrics, Gynecology, and Reproductive Science, & Psychiatry, Mount Sinai Health System

Parent topic – Lelis Vernon
NICU Mom, National Network of Perinatal Quality Collaboratives, Patient and Family Centered Care advocate

Racial/ethnic disparities in NICU care quality – Jochen Profit, MD
Associate Professor of Pediatrics (Neonatology), Stanford University

Change Management – Bethany Robertson, DNP, CNM
Assistant Professor Clinical, Emory University

For More Information, go to www.fpqc.org
THANK YOU!

Technical Assistance:
FPQC@health.usf.edu

Partnering to Improve Health Care Quality for Mothers and Babies