



# ILPQC Neonatal Abstinence Syndrome Initiative Workgroup

July 17, 2017

1:00 – 2:00 pm

# Overview

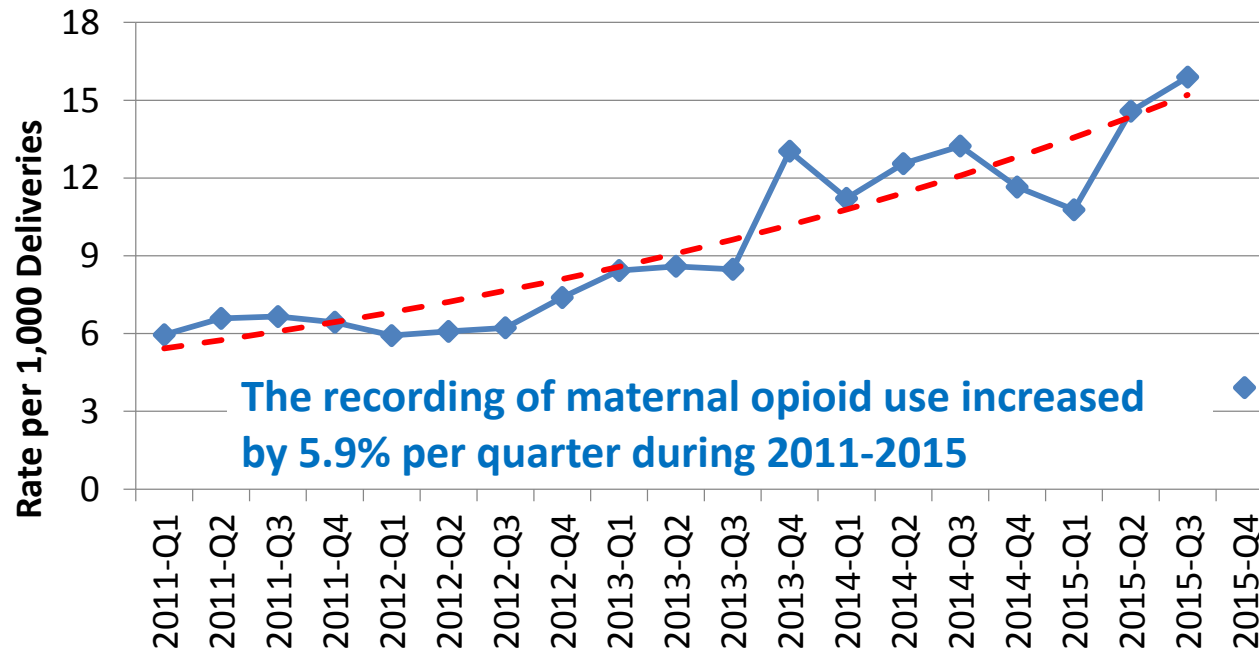
- NAS Illinois Data (from IDPH)
- NAS State Research Groups
  - Massachusetts
  - Ohio
  - Tennessee
- Next Steps
  - IDPH NAS Committee Meeting Prep
  - Literature Review Topics
  - August Call will be a detailed look at IDPH data (tentative)

# Illinois Data on Maternal Opioid Use and NAS



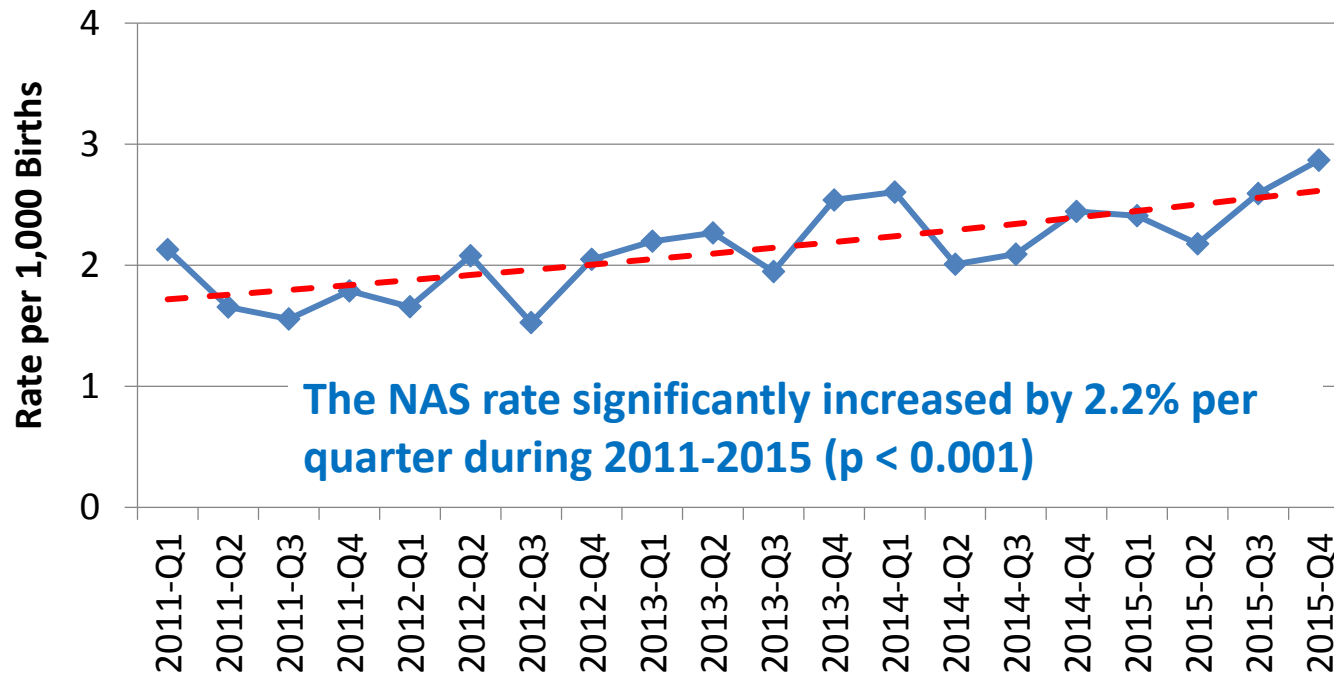
- Source: Hospital Discharge Data
- Dates Released: Available annually to IDPH 6 months after the end of year
- Developing new data resource in the next 12 months via MOD grant:
  - Source: APORS
  - Goals: Validation of hospital discharge data; establishing longer-term outcomes for NAS babies

## Rate of \*Recorded\* Maternal Antenatal Opioid Use among Deliveries, Illinois Discharge Data 2011-2015



Prepared by: Jane Fornoff, D.Phil, Perinatal Epidemiologist / APORS Manager and Amanda Bennett, PhD, MCH Epidemiologist

## Neonatal Abstinence Syndrome (NAS) Rate, Illinois Hospital Discharge Data 2011-2015



Prepared by: Jane Fornoff, D.Phil, Perinatal  
Epidemiologist / APORS Manager and  
Amanda Bennett, PhD, MCH Epidemiologist

# NAS State Research Findings

# Neonatal Quality Improvement Collaborative of Massachusetts & Massachusetts Perinatal Quality Collaborative

Neonatal Abstinence Syndrome Inpatient  
Management

## AIM

Neonatal - improve care of infants impacted by perinatal opioid use and NAS

Obstetric - Improve the care of mothers affected by opioid use during and after pregnancy



# Process, Outcome, Balancing Measures

## Outcomes

1. Increase the % of mothers with opioid use who are in MAT during pregnancy
2. Increase family engagement in care of babies at risk for NAS (% MBM at d/c)
3. Increase EI enrollment for babies with NAS

# Data Collected

## MA Summary of Data Collected:

- Percent of mothers of SENs in medication-assisted treatment
- Percent of SENs requiring pharmacologic treatment
- Percent of SENs receiving non-pharmacologic interventions
- Percent of SENs receiving breastmilk
- Average length of stay for infants with NAS
- Average length of pharmacologic therapy for infants with NAS
- Location of care for infant with NAS
- Staff attitude assessments when caring for infants with NAS
- Readmission rate for infants with NAS after discharge
- Rate of enrollment in EI at 1 year of age for infants with NAS
- # of hospitals with standard guidelines for specific aspects of NAS care\*\*

\*SENs = Substance Exposed Newborns

\*\*The last item was in a 2/22/17 summary of their NAS initiative and was stated in the narrative but not listed in Key Metrics so not sure we should include it.

# Key Components of Toolkits/ Other Resources

## **Prenatal Consultation:**

Obstetrician and the Pediatrician.

Comprehensive education for the mother and the family.

Length of stay in the hospital for the infant evaluation, and management of NAS.

DCF involvement for Safe transition of the baby to home.

## **Inpatient Monitoring Recommendations:**

Infants to be monitored for 5 to 7 days in the hospital for withdrawal signs and symptoms.

## **Department of Children and Families (DCF):**

Written policy for reporting positive tests and other concerns to DCF.

Infants born to mothers on opioid agonist treatment (methadone and buprenorphine) should be reported.

# Key Components of Toolkits/ Other Resources

## **Toxicology Screening:**

Known or suspected substance use,  
including methadone and/or buprenorphine agonist therapy,  
minimal or no prenatal care,  
Infants with signs/symptoms of NAS  
Placental abruption,  
Unexplained IUGR,  
Unexplained neonatal seizures or apnea in a term infant.  
Maternal Urine Toxicology, infant urine, meconium, cord toxicology.

## **NAS Scoring and Assessment Tools:**

Assessed every 3-4 hours, not one point in time.  
Scored after feeding and kept in mother's room all the time.  
Finnegan Neonatal Abstinence Scoring Tool:  
high inter-rater reliability coefficient of 0.82.  
Scores >8 are used to determine the need for pharmacotherapy.  
Questions have arisen as it overlaps symptoms with normal infant behavior and lack of validation for pharmacotherapy.

# Key Components of Toolkits/ Other Resources



## **Non-Pharmacologic Care:**

Mother as the primary caretaker.

Clustering of infant care / allowing for uninterrupted periods of sleep.

Swaddling, Pacifiers, decreased environmental stimuli to noise and light.

## **Breastfeeding:**

Breastfeeding decreases the severity of NAS and need for pharmacotherapy by 30-50%, with associated shorter hospitalizations by 1-2 weeks.

Babies may require more frequent feedings or higher volumes of feeding when withdrawal symptoms are present

especially symptoms likely to be associated with increased energy expenditure (e.g., undisturbed tremors, excessive crying) or increased losses (e.g., vomiting, diarrhea).

Methadone and buprenorphine are both lactation category 2 medications, with extremely low levels in infant plasma. Hepatitis C infection in the mother is not a contraindication for breastfeeding.

Marijuana, accumulates in the breast milk with potential risk for neurodevelopment impairment.

Maternal education about the potential harm and about safe breastfeeding.

# Key Components of Toolkits/ Other Resources

## **Pharmacologic Management:**

Morphine and Methadone,  
Buprenorphine may be more beneficial for buprenorphine- exposed infants.  
Adjunctive Therapy Options: Phenobarbital, Clonidine.

## **Discharge Planning:**

Ensuring a safe home environment.  
Discharge after 4-7 days for infants who do not need pharmacotherapy,  
Discharge 24-48 hours off of opioid replacement therapy for pharmacologically treated infants.  
Stable weight and adequate oral intake  
Infant follow up clinic  
    for failure to thrive, behavioral and developmental delays,  
HIV and Hepatitis C screening.

# Collaborative Learning Opportunities & Content

2012- AAP releases statement calling for standardized care for infants with NAS  
<http://pediatrics.aappublications.org/content/early/2012/01/25/peds.2011-3212>

VON responds to this call by launching multicenter QI collaborative focused on rapid cycle adoption of AAP guidelines, standardizing practice through evidence-based policies

- 2015- MA becomes one of five statewide collaboratives involved in the VON Universal Training Solutions for NAS

- 2016- VON publishes initial results of QI efforts with MA leading the cause

<http://pediatrics.aappublications.org/content/early/2016/04/13/peds.2015-3835>

# Collaborative Learning Opportunities & Content

2012-present

At the state level, MA has committed to improving care and outcomes for substance exposed newborns and their families through various partnerships

- Bureau of Substance Abuse Services- increase treatment availability to mothers
- Department of Children and Families- improve protocols for screening and monitoring of high risk families
- Community-based agencies and peer support programs- increase referral base
- Early Intervention- increase enrollments of infants with NAS
- NeoQIC/MPQC and Massachusetts Department of Public Health



# Collaborative Learning Opportunities & Content

Outreach to 40 state hospitals with goal to standardize and improve care practices:

- Encouraging comprehensive care coordination for both mom and baby
- Built around twice yearly statewide summits, annual state of the art webinar series, periodic data audits, toolkit of best practices
  - Clinical outcomes already moved include decreased LOS, decreased pharmacologic treatment, and increased use of human milk

2017

- QI initiative to expand and be built around multi-disciplinary hospital improvement teams, structured quality improvement education facilitated by NICHQ, structured quality improvement methodology, shared database with online entry, regular progress reports, in addition to twice yearly statewide summits and regular webinars

# QI Support Models

QI is “Quality improvement model” with PDSA cycles

Support model for sustaining QI

- twice-yearly statewide summits
- and regular webinars.

Modest financial support (\$2000-\$5000) is provided to participating teams to help defray some of the costs of participation.

# Ohio Perinatal Quality Collaborative

Neonatal Abstinence Syndrome  
Project

# AIM

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.

# Process, Outcome, Balancing Measures

## Process Measures

- Percent non-pharmacologic bundle compliance- infants that received any non-pharmacologic elements before drug treatment
  - Percent infants receiving low lactose feeding
  - Percent of infants receiving 22 kcal/oz feeds
  - Percent of infants fed breastmilk
- Percent pharmacologic bundle compliance

# Process, Outcome, Balancing Measures

## Outcome Measures

- **PRIMARY:** Average length of stay for pharmacologically treated infants
- Average length of opiate treatment for pharmacologically treated infants
- Percent of exposed infants treated pharmacologically
- LOS for all NAS babies whether or not treated pharmacologically (added later)
- Percent infants requiring dose escalation for failing a weaning step
- Percent of infants with > 10% weight loss

# Process, Outcome, Balancing Measures

## **Balancing Measures**

- Readmissions within 30 days of birth

## **Counter Balancing Measures**

- Maintain inter-rater reliability scores at > 90%

# Data Collected

- Rate per 10k over 10 years
- Attitude survey of providers
- Monthly data collection
  - LOS NAS infants
  - Average length opiate treatment
  - LOS for pharmacologically treated infants



# Data Collected

- Monthly data collection continued
  - % BF infants
  - Non-pharmacological bundle compliance (in aggregate and type)
  - Pharmacological treatment
  - % Pharmacological treatment compliance (in aggregate and elements)
  - % required dose escalation or failed a wean step
  - % infants receiving secondary medication
  - Disposition of infant
  - Social work or safety plan in place
  - Mother involved?

# Key Components of Toolkits/ Other Resources

- Treatment protocol
  - Reliable NAS scoring
  - Non-pharmacological treatments
  - Pharmacological treatments (Morphine or Methadone)
    - Initiation phase
    - Escalation phase (may include second drug- phenobarbital)
    - Stabilization
    - Weaning phase
  - Discharge
- Primary prevention
  - Comprehensive approach to reduce prescription drug abuse and NAS
  - Non-judgmental social support services
  - Social media

# Collaborative Learning Opportunities & Content

- QI Support Model
- Mandatory training - Scoring, Addiction Education
- Education for Attitudes
  - Vermont Oxford DVD “Nurture the Mother -Nurture the Child”
  - Addiction Education - Addiction as a chronic disease - (Attitude Education)
  - Patient panel discussion
  - Thinking about the verbiage we use - “Better” Language
  - Attitude Measures Survey
- NAS Data Sheet
- Government Roll-out of initiative - The OPQC NAS project is funded by The Ohio Department of Medicaid
- Team Storyboard Sharing Session (held at their OPQ Learning Session)

# QI Support Models

## 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?

Very small scale test → Follow up tests → Wide scale tests of change →  
Implementation of Change

Hunches, Theories, Ideas ☐ PDSA - DATA - PDSA - DATA - PDSA ☐ Changes That  
Result in Improvement

\*Sequential building of knowledge under a wide range of conditions

# Tennessee Initiative for Perinatal Quality Care

NAS Management Optimization: A  
TIPQC Inter-institutional QI Project

# AIM

The aim of this project is to improve the health of infants admitted to the NICU for management of Neonatal Abstinence Syndrome in Tennessee. We seek to optimize our management by attaining high reliability (>90%) processes for NAS scoring, NAS treatment initiation and weaning, and post-NAS discharge preparation by December 2013.

# Process, Outcome, and Balancing Measures

## Outcome Measures:

- Hospital Length of Stay for NAS Rx (calculated from:)
  - o Date Start NAS Rx
  - o Date Stop NAS Rx
- Length of Stay (calculated from:)
  - o Date of Admission
  - o Date of Discharge

# Process, Outcome, and Balancing Measures

## Process Measures:

- Basis of NAS Diagnosis
- Source of substance
  - o Maternal
  - o Infant



# Process, Outcome, and Balancing Measures

## Process Measures (cont'd):

- NAS Management (Select all that apply)
  - o Not indicated
  - o Behavioral and Environmental
  - o Pharmacological
- Completion of standardized outlier review
- Review audits for reliability of implementation of PBPs (Potentially Better Practices)

# Process, Outcome, and Balancing Measures

## **Balancing Measures:**

- Non-NAS Length of Stay (Days between end of NAS Rx and discharge)
- Readmissions

# Data Collected (Background)

East Tennessee Children's Hospital (ETCH) experienced an increased number of admitted babies who require pharmacotherapy to control withdrawal symptoms: 35 babies in 2008, 60 in 2010, 135 in 2011, and at our current rate of admissions for NAS the 2012 projection is 260.

In the nineteen months since the project began ETCH has admitted 299 infants for treatment of NAS and has completely weaned 269 infants prior to discharge with an average length of stay (LOS) of 38 days. Infants with  $\leq 40$  days LOS ( $n=179$ , 66.5%) had an average LOS of 24 days, and infants with  $> 40$  days LOS ( $n=90$ , 33.5%) had an average LOS of 65 days. The previous treatment plan in which the infants were discharged to wean at home had an average LOS of 30 days.

# Project Data Collection

Tennessee used REDCap for its on-line data collection for this project. After sufficient baseline data is accumulated, individual REDCap records with outlying lengths of stay will be identified using statistical process control charts. Existing process performance and outcomes are quantified and a baseline is established through data collection, the team will make a data-driven decision on which change to implement first.

Teams submitted 7 required data elements per patient for initial baseline data collection. The first data set contains patient level data and contains minimal private health information.



Additional optional fields on the data form are included to better

understand the sources of variation that pilot centers have encountered in analyzing the primary outcome variable, length of stay.

# REDCap Initial data collection

## REDCap

- Name
- MRN
- TIPQC patient ID (Generated by REDCap)
- Date of Birth (Optional- required for stratification)
- Date of Admission
- Date of Discharge
- Estimated Gestational Age at birth (Optional- required for stratification)

## Outcome Measures:

- Length of Stay for NAS Rx (calculated from:)
  - o Date Start NAS Rx
  - o Date Stop NAS Rx
- Length of Stay (calculated from:)
  - o Date of Admission
  - o Date of Discharge

# Red Cap second data collection



## Process Measures:

Basis of NAS Diagnosis (Select all that apply)

- Maternal History
- Clinical Signs (Clinical NAS- see definitions above)
- Screening Test
- Confirmatory Test (Laboratory NAS- see definitions above)

Source of substance (Select all that apply)

Maternal

- Supervised Prescribed Replacement Therapy (MR)
- Supervised Prescribed Pain Therapy (MP)
- Prescribed for Psychiatric or Neurological Condition (PN)
- Prescription substance obtained without Prescription (wo)
- Non-prescription substance (non) Infant

NAS Management (Select all that apply)

- Not indicated
- Behavioral and Environmental
- Pharmacological

Completed of standardized outlier review

Review audits for reliability of implementation of PBPs  
(Potentially Better Practices)

## Balancing Measures:

- Non-NAS Length of Stay (Days between end of NAS Rx and discharge)
- Readmissions

Stratifying Measures: (Optional Measures- see data form)

- Maternal Disposition
- Infant Disposition
- EGA adjusted estimate of LOS attributable to prematurity for infants less than 37 weeks EGA at birth ( $LOS(EGA) = LOS - (37 \text{ weeks} - EGA)$ )
- Diagnoses with potential for state dysregulation independent of perinatal substance exposure
  - o Seizure disorder documented on EEG
  - o Stroke or intracranial hemorrhage
  - o Major CNS malformation
- Diagnoses or procedures requiring protracted sedation and/or analgesia
  - o Total days prescribed sedation and/or analgesia
- Gastroschisis

# Key Components of Toolkits/ Other Resources

- Collection EBP based on literature & QI work
- Tennessee teams created
  - a) Toolkit
  - b) Data Collection forms
  - c) Report generation system

# Key Components of Toolkits/ Other Resources (Cont'd)

1. Formation primary involvement team, consisting:
  - a. 5-7 end users
  - b. Multidisciplinary
  - c. Family member
2. Meet & review toolkit & current practices
3. Data driven QI
  - a. Gather data current process & outcomes (baseline data)
4. Practice analysis & Identify Potential change targets



# Key Components of Toolkits/ Other Resources (Cont'd)

## 5. Menu of Potentially better practices overview (PBP)

- Review & assess current management
- Establish/refine standardized NAS management approach
  1. Detection
  2. Non-pharmacologic management (behavior/environment)
  3. Pharmacologic management
  4. Scoring
  5. Transition/follow-up after discharge (pts going home on medication)
  6. Monitor/implementation (outcomes, QI, scoring, response to scoring)
  7. Engage all stakeholders
  8. Monitor environment, caregivers & families

# Collaborative Learning Opportunities & Content

- Outlier review using statistical process control charts can be useful to further refine the efficiency and effectiveness.
- Many helpful resources/tips are available/cited, including the following
  - Retrospective reviews: Jansson 2009, Cleary 2010, Bio 2011, Jansson 2012, Hamdan, 2012, Grim, 2013
  - Evidence Based Guidelines: ACOG 2012, SOGC 2011, AAP 2012, \*Recent NICHD workshop summary statement in J Ob/Gyn (July, 2017)
  - Use of webinar for education prior to statewide kickoff
  - “Just In Time” training modules on the TIPQC website (<http://www.tipqc.org/jit>)
  - Engagement and education of Upstream providers and Downstream utilizers of NAS services- use of written materials provided by the hospitals
  - Evidence Review Summary: Karen D’Apolito, PhD, APN, NNP-BC, FAAN

# QI Support Models

Shewart Cycle/PDSA cycles were used.

# Next Steps on State PQC Reviews



- Thank you state PQC Review teams!
- ILPQC will review and streamline State PQC Review
- Leslie will present State PQC initiative review at July 20<sup>th</sup> IDPH NAS Advisory Committee Meeting

# NAS Initiative Next Steps



- Identify subgroup leadership and membership for each Literature Review topic (next slide)
  - Connect with team by 7/24
  - Develop slides and send to [info@ilpqc.org](mailto:info@ilpqc.org) by 8/14
- Prepare content - Work and share on google drive (a folder per topic)
- Begin sharing on August ILPQC NAS Workgroup Call and continue through September, October
- Next Call: August 21, 2017 (save the third Monday of every month from 1-2pm)

# NAS Initiative Literature Review Topics



- OB: Prenatal screening, consultation, counselling, treatment/referrals/follow-up
- Exposure/Toxicology Tools
- NAS assessment tools and scoring
- Non-pharmacological treatment
- Pharmacological treatment
- Discharge and follow-up

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