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# Evidence-based models of NAS/NOWS infant care

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NAS ECHO – 7/20/21



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**SCHOOL OF MEDICINE**  
INDIANA UNIVERSITY

# Disclosures

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- I have no relevant financial relationships with the manufacturers of any commercial products or providers of commercial services discussed in this activity.
- I do not intend to discuss an unapproved/investigative use of a commercial product/device in our presentation.

# Objectives

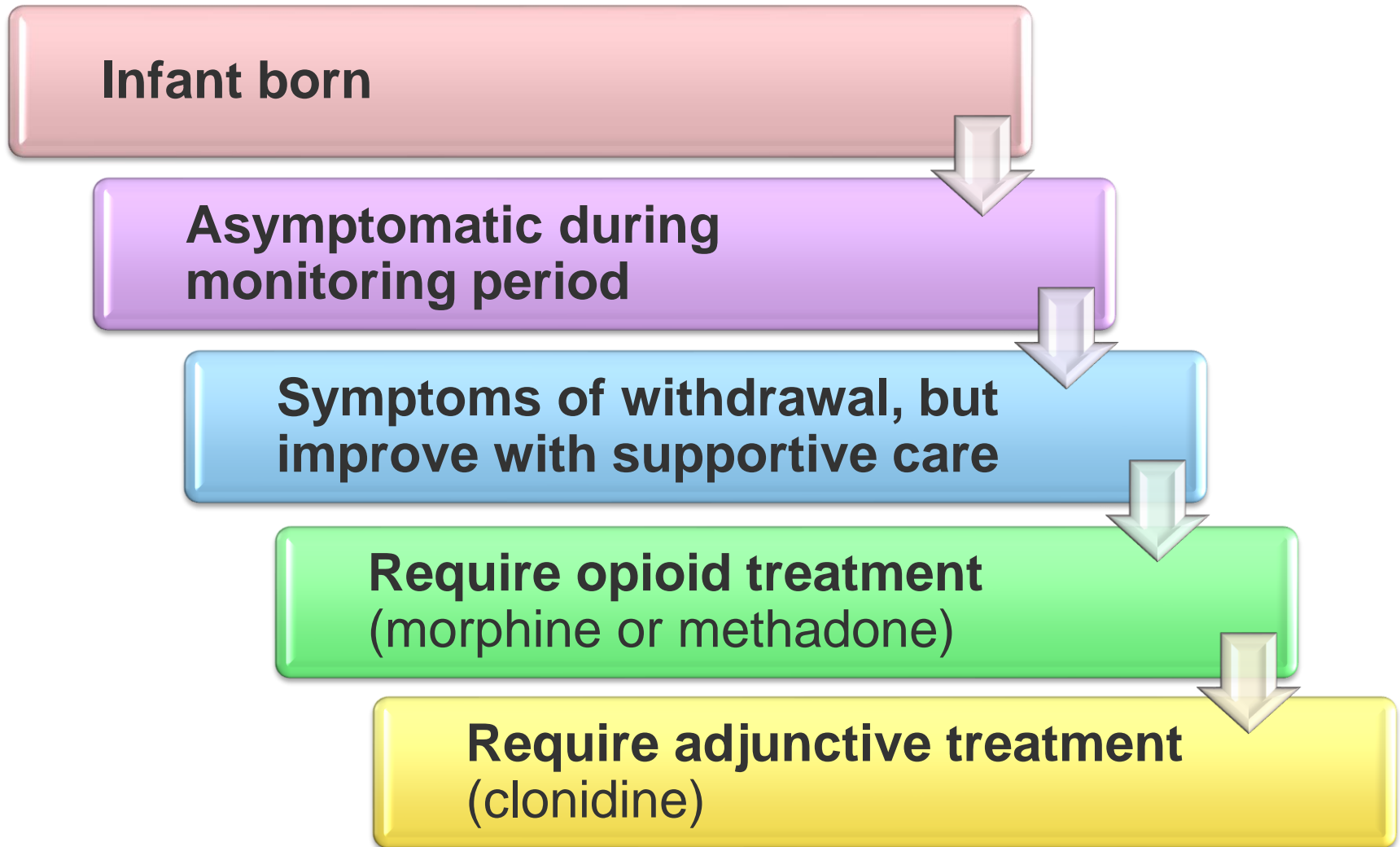
- Review importance of supportive care
- Understand the benefits of rooming-in with NAS
- Explore the Eat Sleep Console (ESC) scoring tool
- Discuss challenges and opportunities



# Finnegan score? Eat, Sleep, Console?

- Less focus on the scoring tool itself, but rather the culture and the environment of care.
- More focus on:
  - Activities of Daily Living (ADL's)
  - Maximizing supportive (non-pharmacologic) care
  - Supporting the dyad
  - Right location for baby

# Interventions in opiate exposed infants



# Supportive care for babies at risk of NAS

- Set expectations that families should remain at bedside
  - Have moms identify a SUPPORT to stay as well
- Empower parents to be experts in supportive care
  - Attentive but quiet, low stimulation
  - Skin to skin
  - Swaddling, rocking
- Breastfeed
  - Frequent, on-demand
- Cluster care
  - Don't wake a sleeping baby



# Benefits of Rooming-in Care

- *Pediatrics*, 2016

## Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost

Alison Volpe Holmes, MD, MPH,<sup>a,b,c</sup> Emily C. Atwood,<sup>a</sup> Bonny Whalen, MD,<sup>a,b</sup> Johanna Beliveau, RN, MBA,<sup>b</sup> J. Dean Jarvis, RN, MBA,<sup>b</sup> John C. Matulis, DO, MPH,<sup>d</sup> Shawn L. Ralston, MD<sup>a,b</sup>

**BACKGROUND AND OBJECTIVE:** The incidence and associated costs of neonatal abstinence syndrome (NAS) have recently risen sharply; newborns with NAS occupy 4% of NICU beds. We implemented a coordinated program for NAS including standardized protocols for scoring, medications and weaning, and a calm rooming-in environment, to improve family-centered care and to decrease both length of stay (LOS) and hospital costs.

**METHODS:** In early 2013, a multidisciplinary quality improvement team began consecutive plan-do-study-act (PDSA) cycles. We trained nurses in modified Finnegan scoring, ensured scoring only after on-demand feeds during skin-to-skin care, and standardized physician score interpretation. We provided

abstract

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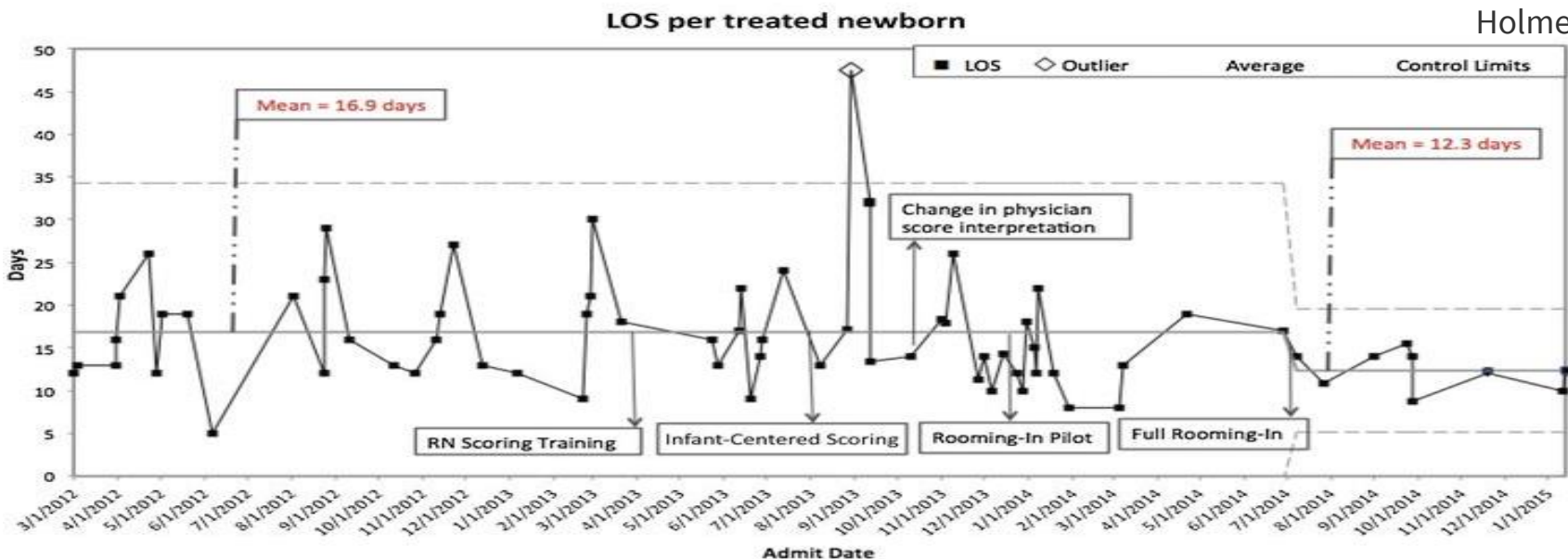
# Family-Centered NAS Care

- Newborns at risk for NAS remained with mother on Postpartum ward
  - To pediatrics ward for ongoing care (not NICU)
- “Infant Centered Scoring”
  - Immediately after feeding while skin-to-skin
- Overall clinical picture evaluated
  - Concern for feeding difficulty, poor weight gain, inability to sleep, inconsolability
  - Less emphasis on tremors, sneezing, yawning, muscle tone



# Family-Centered NAS Care

- Need morphine to treat  
    ↓ 46% → 27%
- Adjunctive use of phenobarbital  
    ↓ 13% → 2%
- Average length of stay for morphine treated  
    ↓ 16.9 → 12.3 days
- Average hospital costs per at-risk infant  
    ↓ \$11,000 → \$3,500



Holmes 2016

February 5, 2018

# Association of Rooming-in With Outcomes for Neonatal Abstinence Syndrome

## A Systematic Review and Meta-analysis

Kathryn Dee L. MacMillan, MD<sup>1,2</sup>; Cassandra P. Rendon, BA, BS<sup>2,3</sup>; Kanak Verma, MPH<sup>2,3</sup>; [et al](#)

» [Author Affiliations](#)

*JAMA Pediatr.* Published online February 5, 2018. doi:10.1001/jamapediatrics.2017.5195

### Key Points

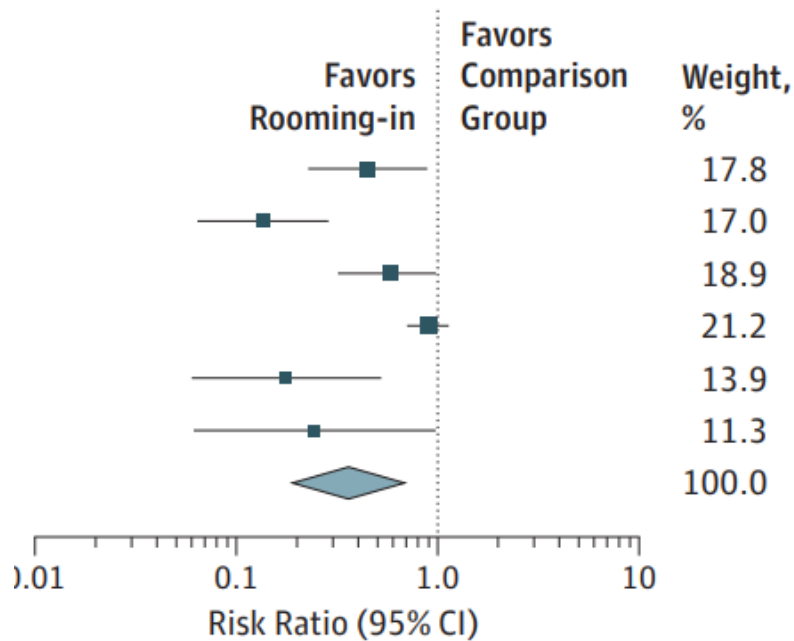
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**Question** Does rooming-in with family reduce the use of medications, length of stay, and costs in the inpatient treatment of neonatal abstinence syndrome?

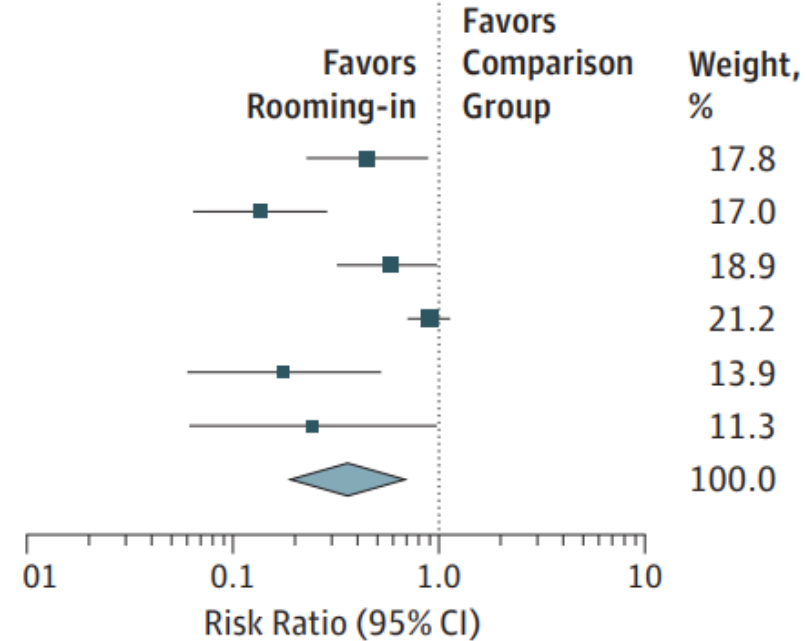
**Findings** In this systematic review and meta-analysis of 6 studies comprising 549 patients,

# Meta analysis – Rooming in with NAS

## ↓ Need for pharmacotherapy



## ↓ Length of stay



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### Key Points

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**Question** Does rooming-in with family reduce the use of medications, length of stay, and costs in the inpatient treatment of neonatal abstinence syndrome?

**Findings** In this systematic review and meta-analysis of 6 studies comprising 549 patients, rooming-in was associated with a reduction in the need for pharmacologic treatment and a shorter hospital stay when rooming-in was compared with standard neonatal intensive care unit admission for neonatal abstinence syndrome.

**Meaning** Rooming-in should be considered as the preferred inpatient care model for all opioid-exposed newborns, including those with neonatal abstinence syndrome.

# Eat, Sleep, Console (ESC)

## RESEARCH ARTICLE

# A Novel Approach to Assessing Infants With Neonatal Abstinence Syndrome

Matthew R. Grossman, MD,<sup>a</sup> Matthew J. Lipshaw, MD,<sup>a</sup> Rachel R. Osborn, MD,<sup>b</sup> Adam K. Berkwitt, MD<sup>a</sup>



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

Matthew R. Grossman, MD,<sup>a</sup> Adam K. Berkwitt, MD,<sup>a</sup> Rachel R. Osborn, MD,<sup>a</sup> Yaqing Xu, MS,<sup>b</sup> Denise A. Esserman, PhD,<sup>b</sup> Eugene D. Shapiro, MD,<sup>a,c</sup> Matthew J. Bizzarro, MD<sup>a</sup>

# Eat, Sleep, Console

- Focus on **FUNCTION**, “activities of daily living”
- Symptom prioritization – Eat, Sleep, Console
- Avoid scoring for items that might not affect ADL’s, less clear clinical significance
  - Sneezing, yawning, tremors
- Ensure no adverse outcomes
  - Hospital readmission, seizures

# Eat, Sleep, Console

Grossman 2017

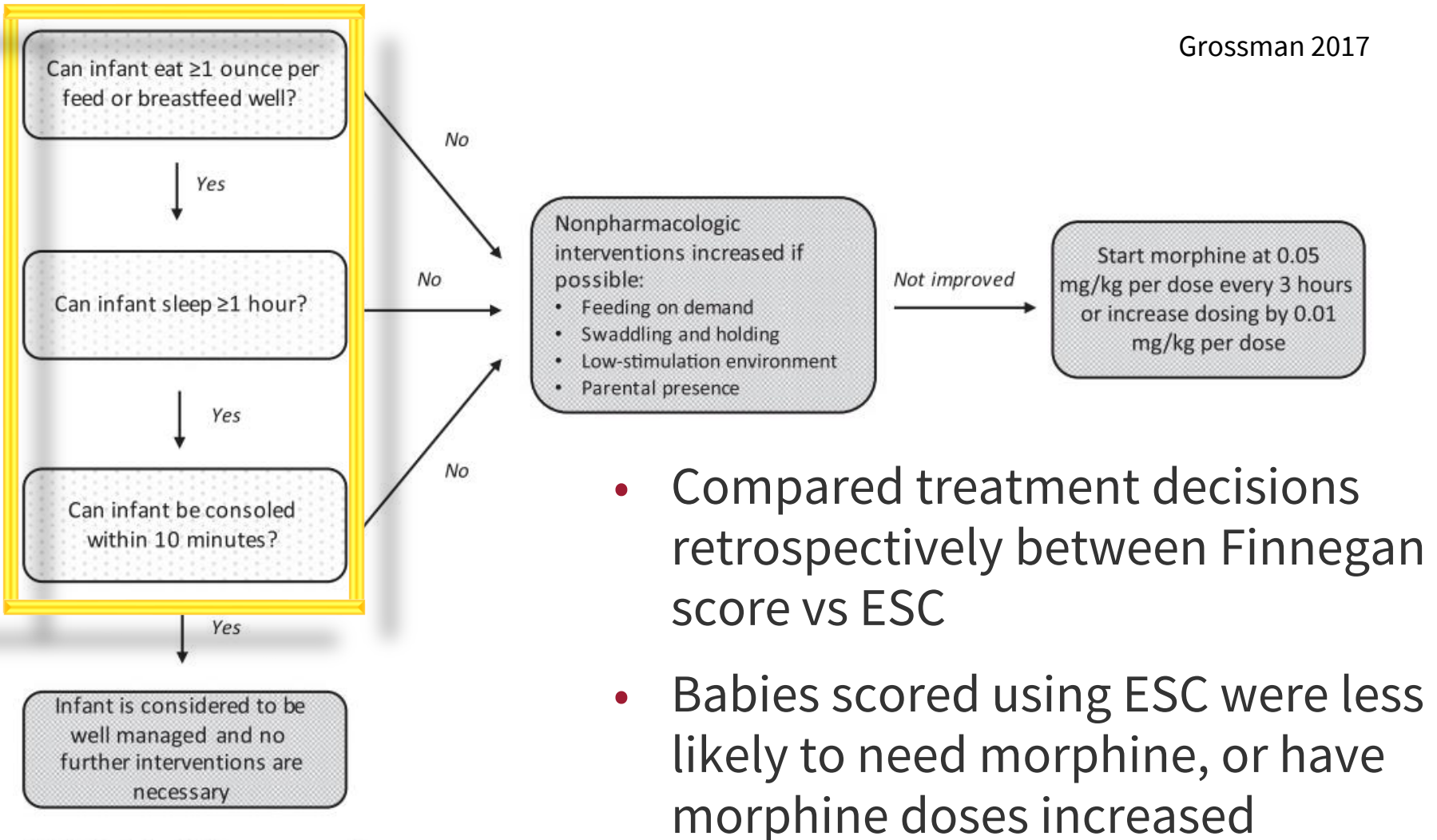
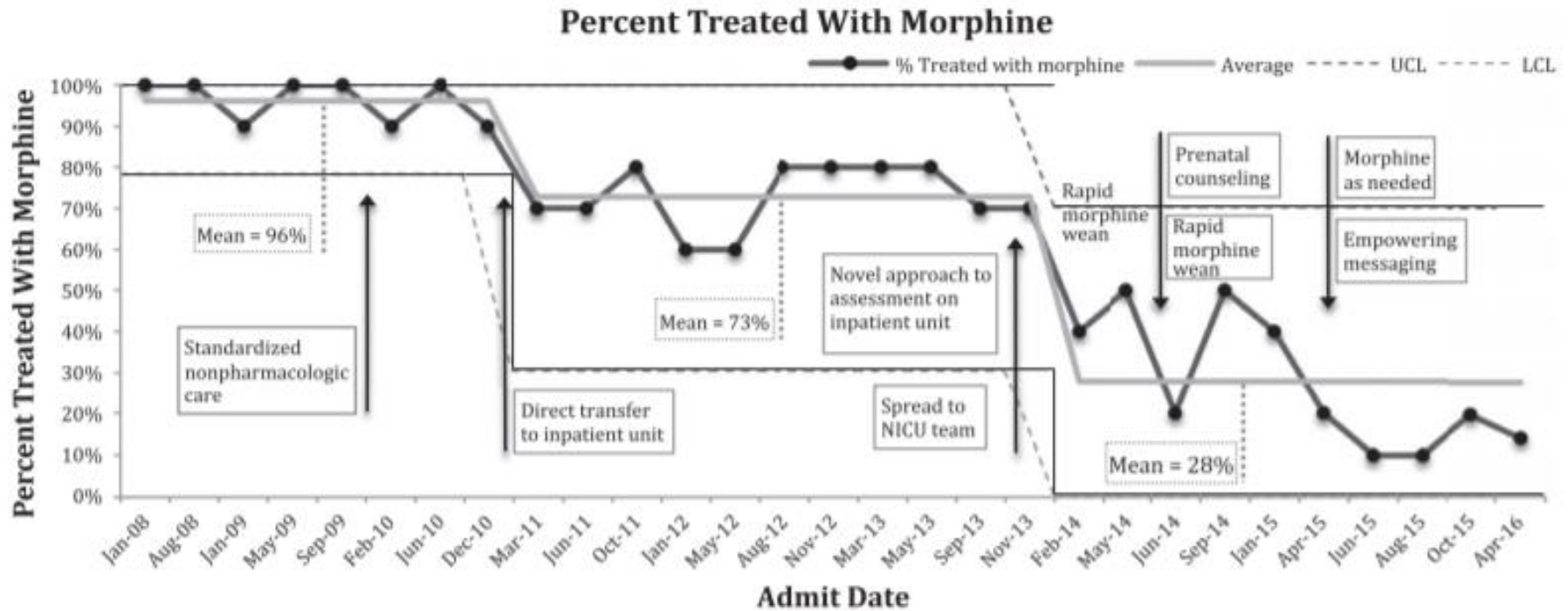


FIGURE 1 ESC approach.



# Eat, Sleep, Console?



- Length of stay – 22.4 to 5.9 days
- Morphine treatment – 98% to 14%
- Average cost - \$45,000 to \$10,000

# ESC – Catching fire

## RESEARCH ARTICLE


### Successful Implementation of the Eat Sleep Console Model of Care for Infants With NAS in a Community Hospital

Douglas Dodds, MD, Kayla Koch, MD, Talia Buitrago-Mogollon, MHA, CPHQ, Sara Horstmann, MD

ORAL FEEDING STRATEGIES: SPECIAL SERIES

### Eat, Sleep, Console Approach

### A Family-Centered Model for the Treatment of Neonatal Abstinence Syndrome

Grisham, Lisa M. NNP-BC; Stephen, Meryl M. CCRN; Coykendall, Mary R. RNC-NIC; Kane, Maureen F. NNP-BC; Maurer, Jocelyn A. RNC-NIC; Bader, Mohammed Y. MD [Author Information](#) 



**ESCaping Morphine in the Newborn Nursery Across Academic and Community Settings**  
MEGAN GLAIT MS2<sup>1</sup>, ANDREA MOYER MS2<sup>1</sup>, KRISTINE SAUDEK MD<sup>2</sup>, ERWIN CABACUNGAN MD<sup>2</sup>, KELSEY RYAN MD<sup>2</sup>  
<sup>1</sup>Medical College of Wisconsin, Milwaukee WI, <sup>2</sup>Department of Pediatrics, Medical College of Wisconsin, Milwaukee WI

"Eat, Sleep, Console" Program In Central Indiana Helps Babies With Neonatal Abstinence Syndrome



## Hospital Pediatrics

AN OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Research Article

### Reduction in Length of Stay and Morphine Use for NAS With the "Eat, Sleep, Console" Method

Thomas Blount, Alana Painter, Emily Freeman, Matthew Grossman and Ashley G. Sutton  
Hospital Pediatrics July 2019, hpeds.2018-0238; DOI: <https://doi.org/10.1542/hpeds.2018-0238>

# Limitations / Challenges - ESC

- ESC focuses on rooming-in, family engagement
- Interobserver reliability of tool (ongoing)
- Lack of large multi-center studies (ongoing)
- No data on long-term follow-up on infants (ongoing)



# Challenges – Rooming in

- Culture change, acknowledging biases
- Family engagement, Nature of opioid exposure
- Education, especially prenatal
- Unsafe sleep, infant falls
- Facility/space limitations, staffing
- Relationship between newborn, NICU, peds teams
- COVID-19 related visitor restrictions

# Opportunities – all pieces are important!

Rooming-in

Tobacco  
reduction

Staff  
huddles

Breastfeeding

Prenatal consults



PRN morphine

ESC

Staff/family education



# Open discussion



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