Neonatal Abstinence Syndrome: Providing Family Centered Care

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October 10, 2018

Riley Hospital for Children
Indiana University Health

SCHOOL OF MEDICINE
INDIANA UNIVERSITY

Disclosures

- We have no relevant financial relationships with the manufacturers of any commercial products or providers of commercial services discussed in this activity.
- We do not intend to discuss an unapproved/investigative use of a commercial product/device in our presentation.
  - ❖ There are no FDA-approved medications for the treatment of neonatal abstinence syndrome

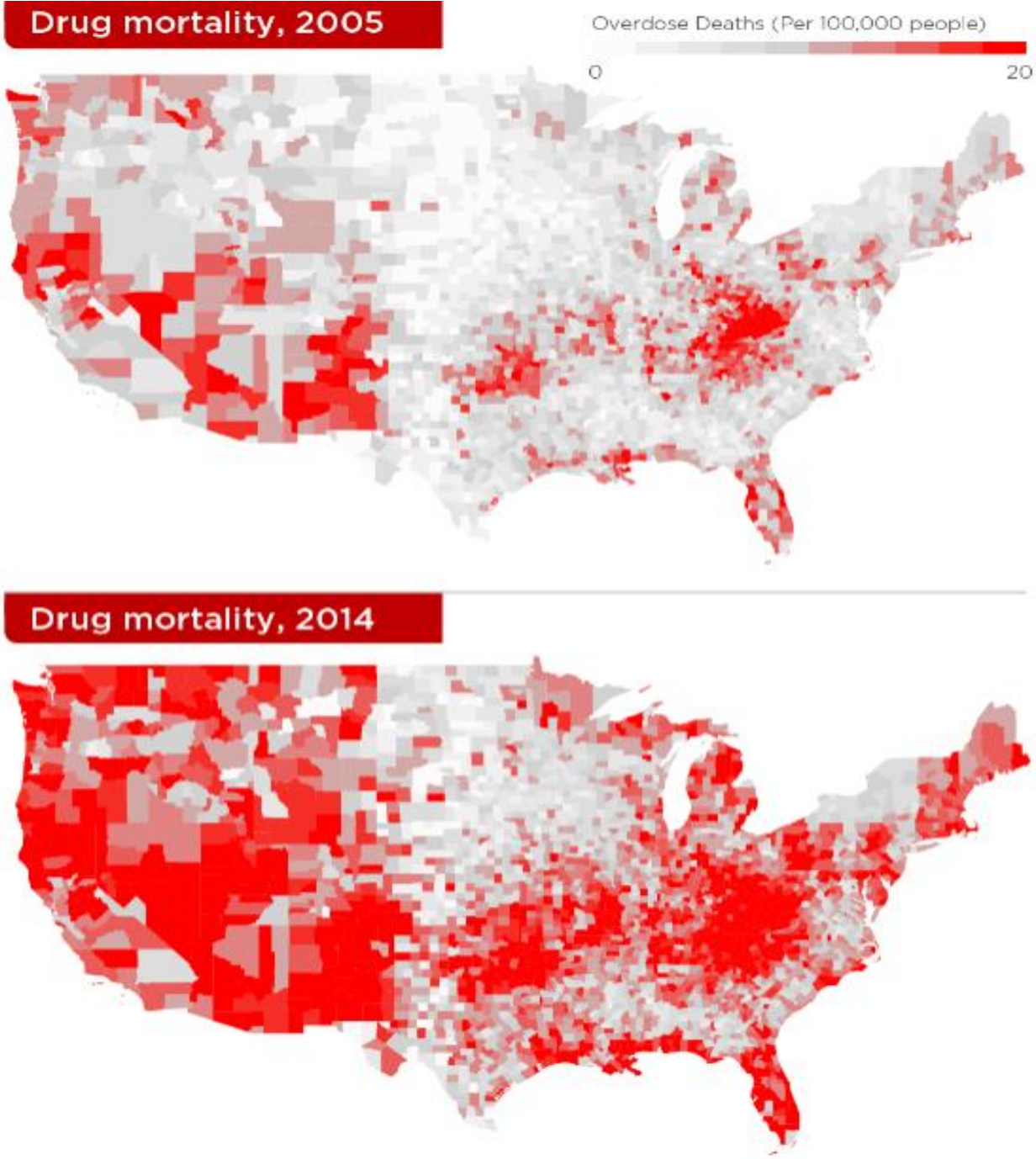
Acknowledgements

INDIANA PERINATAL QUALITY IMPROVEMENT COLLABORATIVE [IPQIC]

INAAP
INDIANA CHAPTER
AMERICAN ACADEMY OF PEDIATRICS

Objectives

- Discuss the scope of the opioid crisis in the US and Indiana, and specifically how this impacts pregnant women and children
- Review the evidence behind family centered care and supportive care for neonatal abstinence syndrome
- Discuss the management of breastfeeding in an infant with neonatal abstinence syndrome
- Understand how implicit bias can impact the care of the family affected by substance use disorder



America's Opioid Crisis

Sources: Centers for Disease Control and Prevention, National Institutes of Health

The opioid epidemic's tiniest patients

Every 25 minutes a baby is born to a mother with an opioid use disorder

8.7 million kids in the US with a parent that has an opioid use disorder

American Academy of Pediatrics, Opioid Fact Sheets

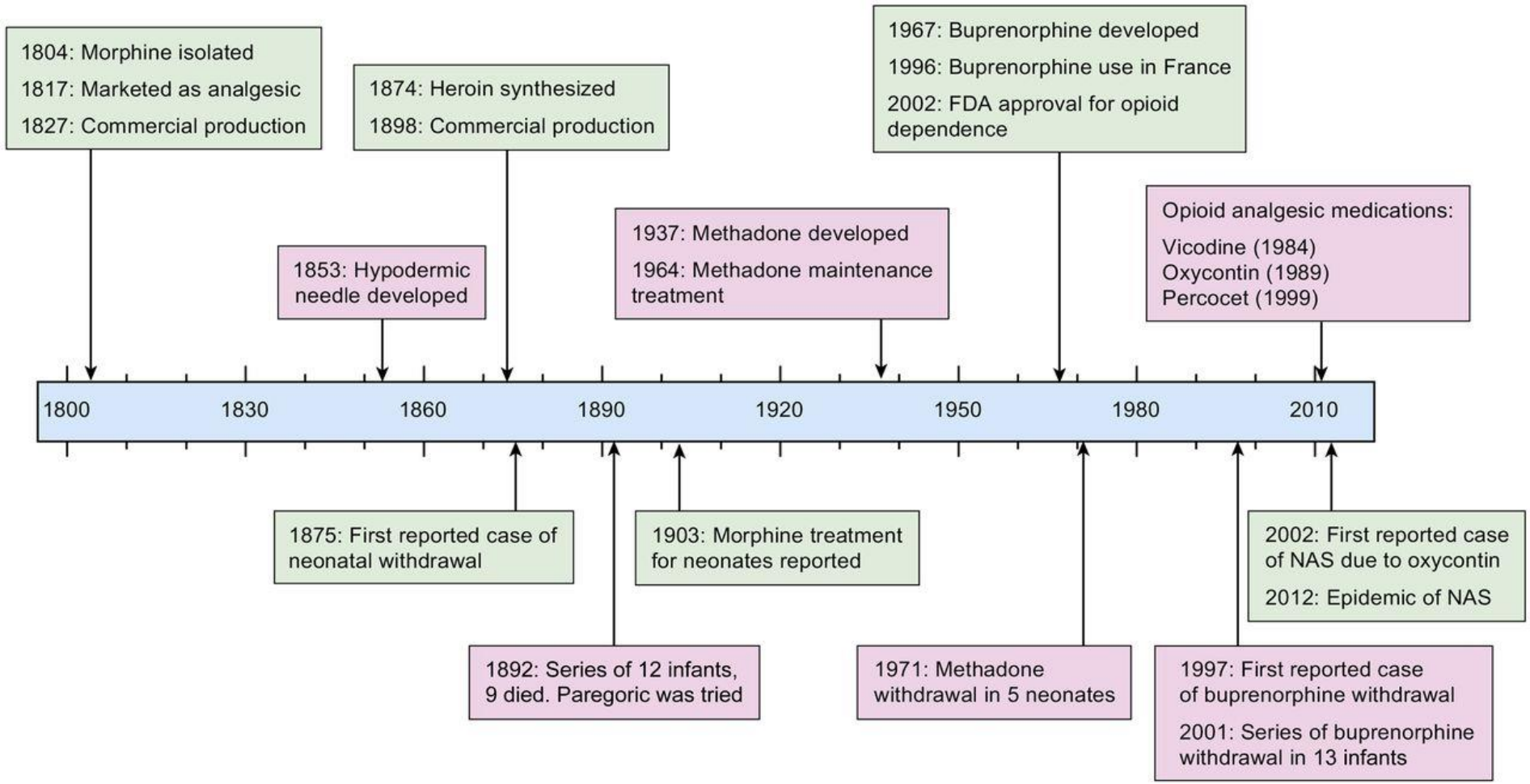
NAS Overview

Neonatal Abstinence Syndrome (NAS)

- Defined as the constellation of clinical findings associated with drug withdrawal in newborns
  - **Opioids**
  - Benzodiazepines
  - Alcohol
  - SSRIs (antidepressants)
- 55-94% of newborns exposed to opiates in utero will have some degree of withdrawal

Hudak 2012

NAS - Historical background



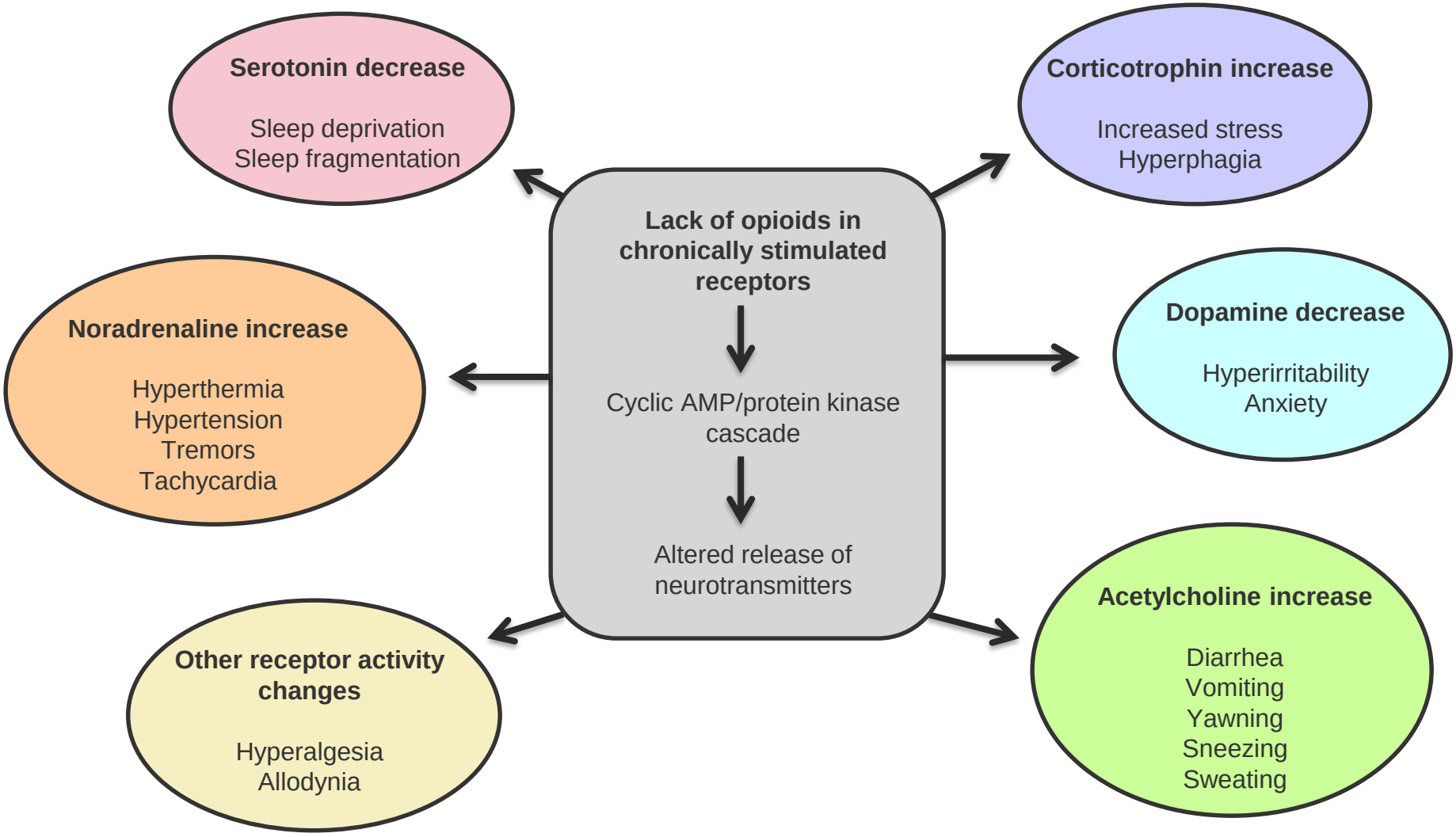
Kocherlakota 2014

Causes of NAS

Opioids

- Heroin
- Pills
  - Hydrocodone, oxycodone
  - Prescription/illicit use
- Maintenance opioids
  - Methadone
  - Buprenorphine (Subutex)
  - Buprenorphine/naloxone (Suboxone)

Symptoms of NAS

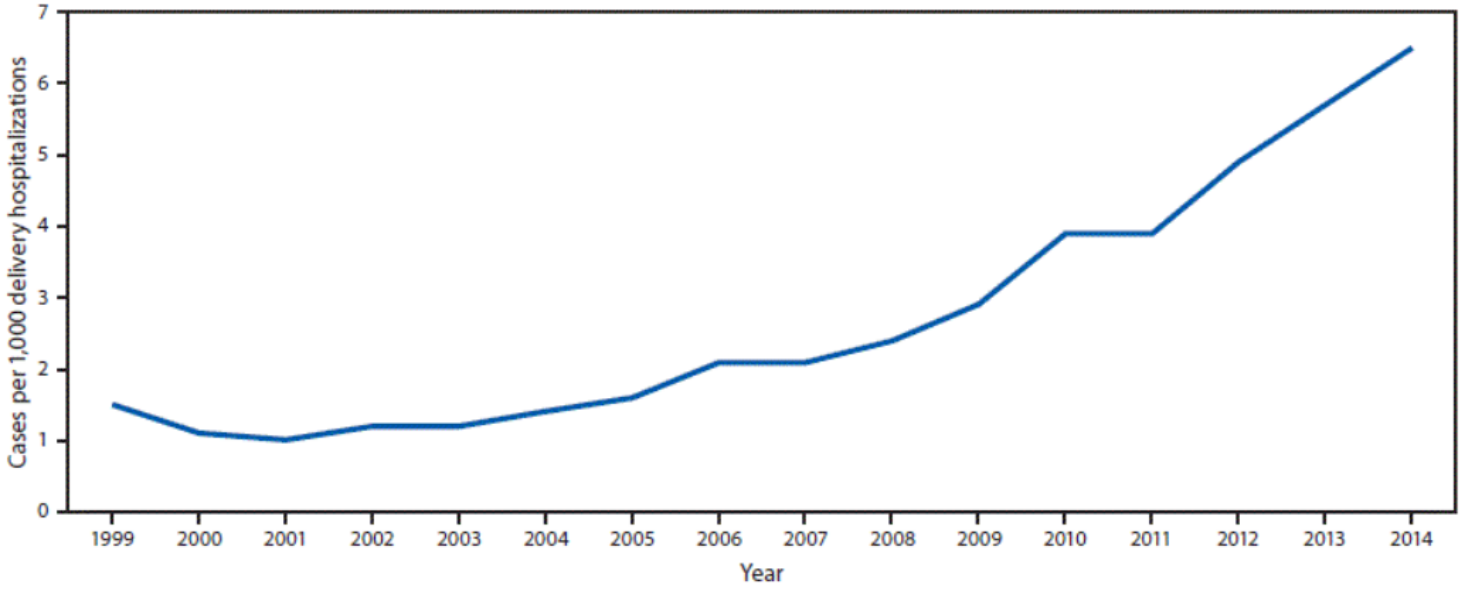


Kocherlakota 2014

CDC MMWR – August 10, 2018

Opioid Use Disorder at the time of delivery quadruples over 15 years

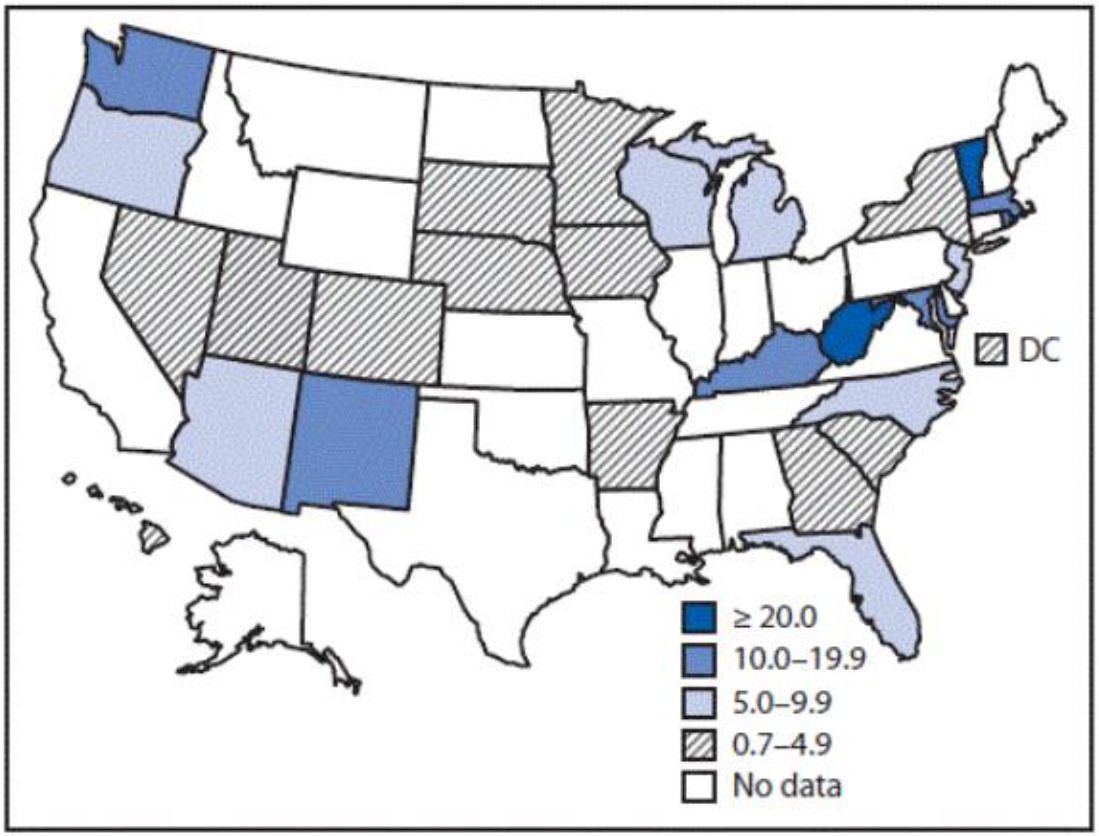
FIGURE 1. National prevalence of opioid use disorder per 1,000 delivery hospitalizations* — National Inpatient Sample (NIS),† Healthcare Cost and Utilization Project (HCUP), United States, 1999–2014



Haight 2018

CDC MMWR – August 10, 2016

FIGURE 2. Prevalence of opioid use disorder per 1,000 delivery hospitalizations* · 28 states, 2013–2014†



CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

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newborns opiate

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Data show high rate of opiate-affected newborns

Maureen Groppe, Star Washington Bureau 3:02 p.m. EDT August 13, 2016

Buy Photo

(Photo: Kelly Wilkinson/IndyStar 2015 file photo)

WASHINGTON — Doctors and nurses at Commu Hospital East in Indianapolis began to suspect in recent years that they were seeing more babies born dependent on opioids and other drugs.

Some infants shook and screamed with the pain of withdrawal. Others were born too small or had trouble breathing.

Now their suspicions are backed up by hard — albeit preliminary — evidence: One in five babies born at Community East in the first six months of 2016 tested positive for drugs. Opiates were the most common substance found in the umbilical cord.

The hospital tested only babies who appeared to be victims of substance abuse. Approximately 60 percent tested positive.

The figures come from a pilot study the Indiana State Department of Health is conducting under a 2014 mandate from the Indiana legislature. The mandate requires state health officials to create a task force to gauge the prevalence in Indiana of neonatal abstinence syndrome (NAS). Babies with the syndrome are exposed to addictive drugs while in the mother's womb and go through withdrawal after being born.

Donetta Gee-Weiler, vice president of women's and children's services with Community Health Network, said the numbers are shocking but not surprising to thos dealing with the issue every day.

"We've seen this and are working with the state to help others understand the incidence of substance abuse," she said. "It's a problem in Indiana."

The NAS task force must come up with a standard way to diagnose and track the condition, and must help health care providers figure out how to prevent and treat it.

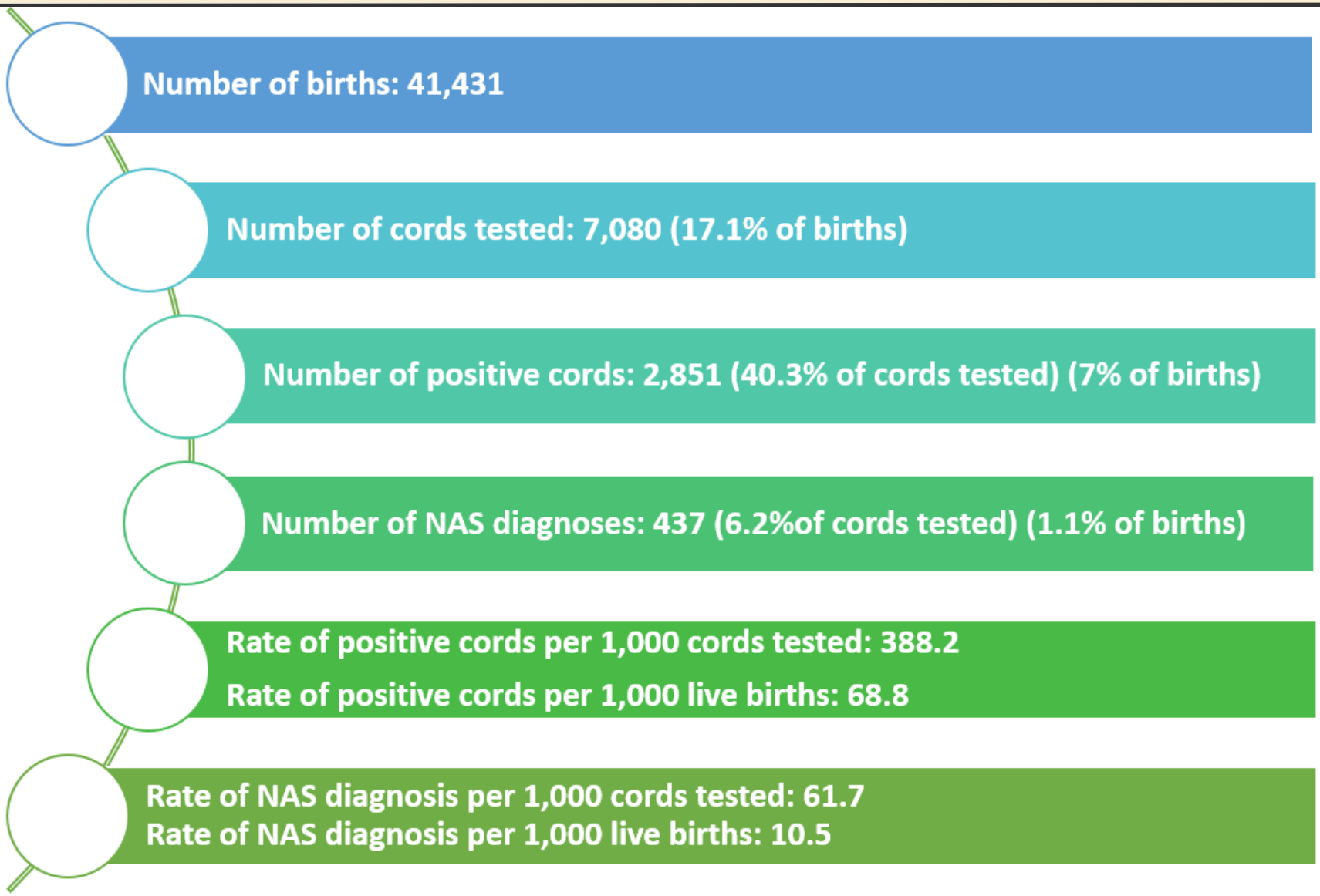
Indiana and the opioid epidemic

- Indiana has the 11th highest rate of opiate prescriptions per person
  - National study found that 80% of all heroin users began opiate use from a legally obtained prescription

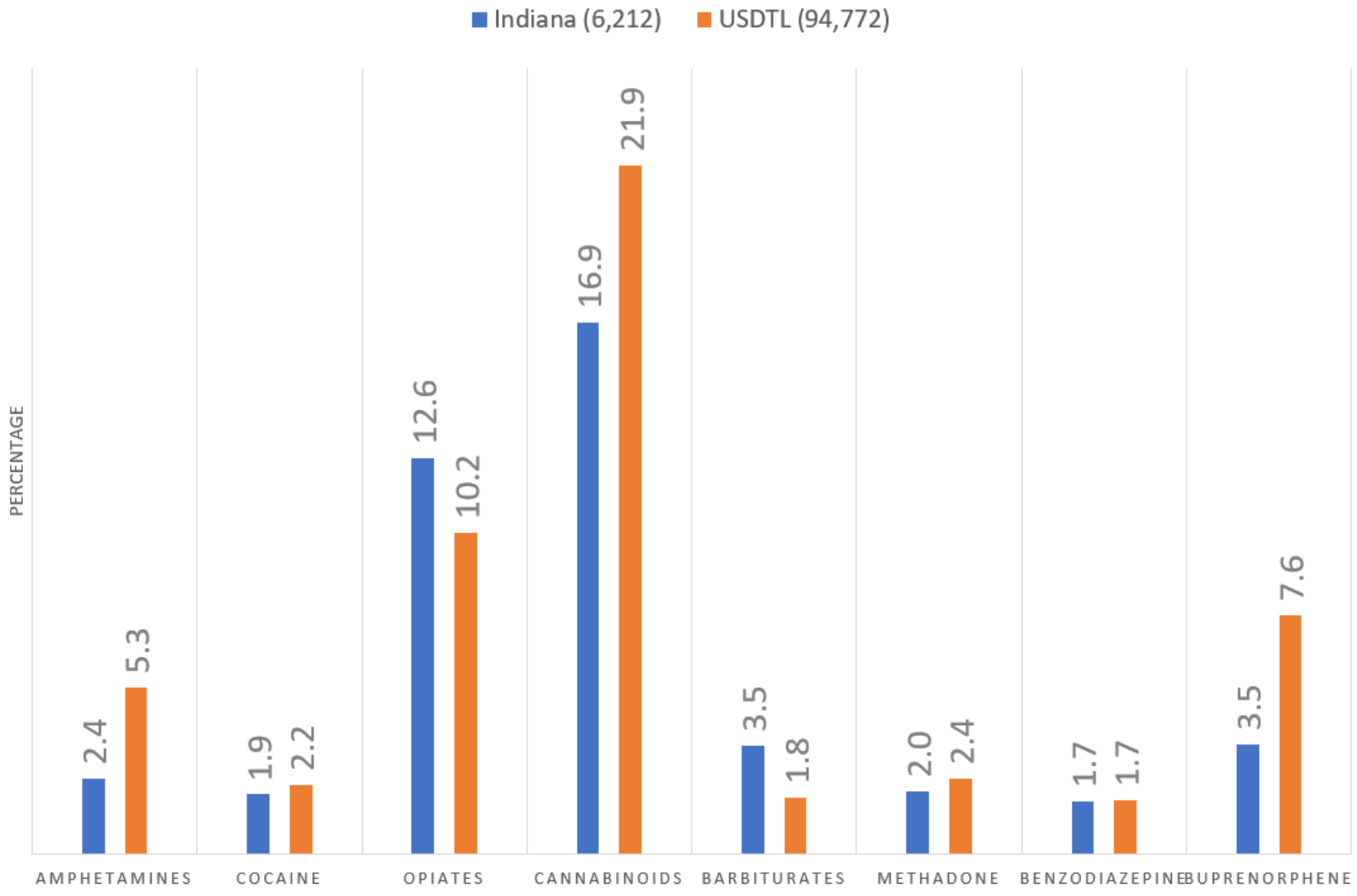
- 12,756 Indiana children placed in foster care in 2016
  - Approximately 20% were infants
  - Parental substance use accounted for 57% of all removals through Dept of Child Services

2017 Labor of Love, Indiana Infant Mortality Summit
American Academy of Pediatrics, Indiana Opioid fact sheet

IPQIC
Screening Report: - 1/1/18 - 7/31/18



IPQIC
Positivity report: 1/1/17 – 8/31/18



Chrissy and Jackson

- Chrissy is a 24 yo G3P3 with opioid use disorder
  - Stable on buprenorphine (Subutex) 24 mg daily during pregnancy
  - Also on fluoxetine for depression/anxiety
  - Stopped smoking during pregnancy
  - Participated in pregnancy Centering group
    - Discussed importance of breastfeeding, rooming in, soothing behaviors
  - Repeat c/s at 39+2 weeks to a 3.4 kg male, Jackson

Tobacco use and Pregnancy

Tobacco exposure and NAS

- Study comparing infants with NAS born to light smokers (<½ PPD) or heavy smokers (>1 PPD)

- Infants with NAS born to heavy smokers had:
  - 57% higher peak NAS scores
  - Longer to peak
  - Trend towards longer duration of morphine treatment and length of stay

Choo 2004

Our team's plan

- Finnegan scores after each feed
- Feeding support
- Observing for 5 days for NAS requiring medication therapy
- "Family-centered care"

Chrissy's Birth Plan

- Breastfeed
- Skin to skin
- Rooming in
- No circumcision until the day of discharge
- Pacifier use
- Trying to avoid the NICU if at all possible

Get everyone on the same page!

- NAS counseling requires consensus
  - OB team
  - Mom's counselors
  - Nursing team (clinic and outpatient)
  - Social workers
  - Lactation consultants
  - Mother-baby pediatric provider
  - NICU team
  - Outpatient pediatric provider
- Set expectation early with the family

- **Whenever possible, have the family meet the newborn team before delivery**

Identify at-risk babies

- Ideally prenatally

- Focus on:
  - –Identifying babies at risk for withdrawal
  - –Monitoring for signs of withdrawal
  - –Offering level of treatment appropriate for infants symptoms

Screening tests

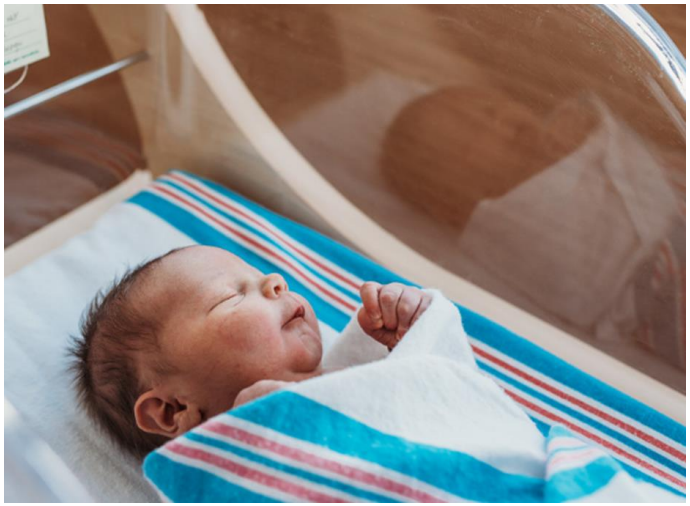
- **Urine drug screens**
  - Mom and baby
- **Meconium drug screens**
- **Umbilical cord analysis**
  - Benefits: cord is immediately available, can be stored and sent later if symptoms develop

Mehta 2013
Montgomery 2006

Timing of withdrawal

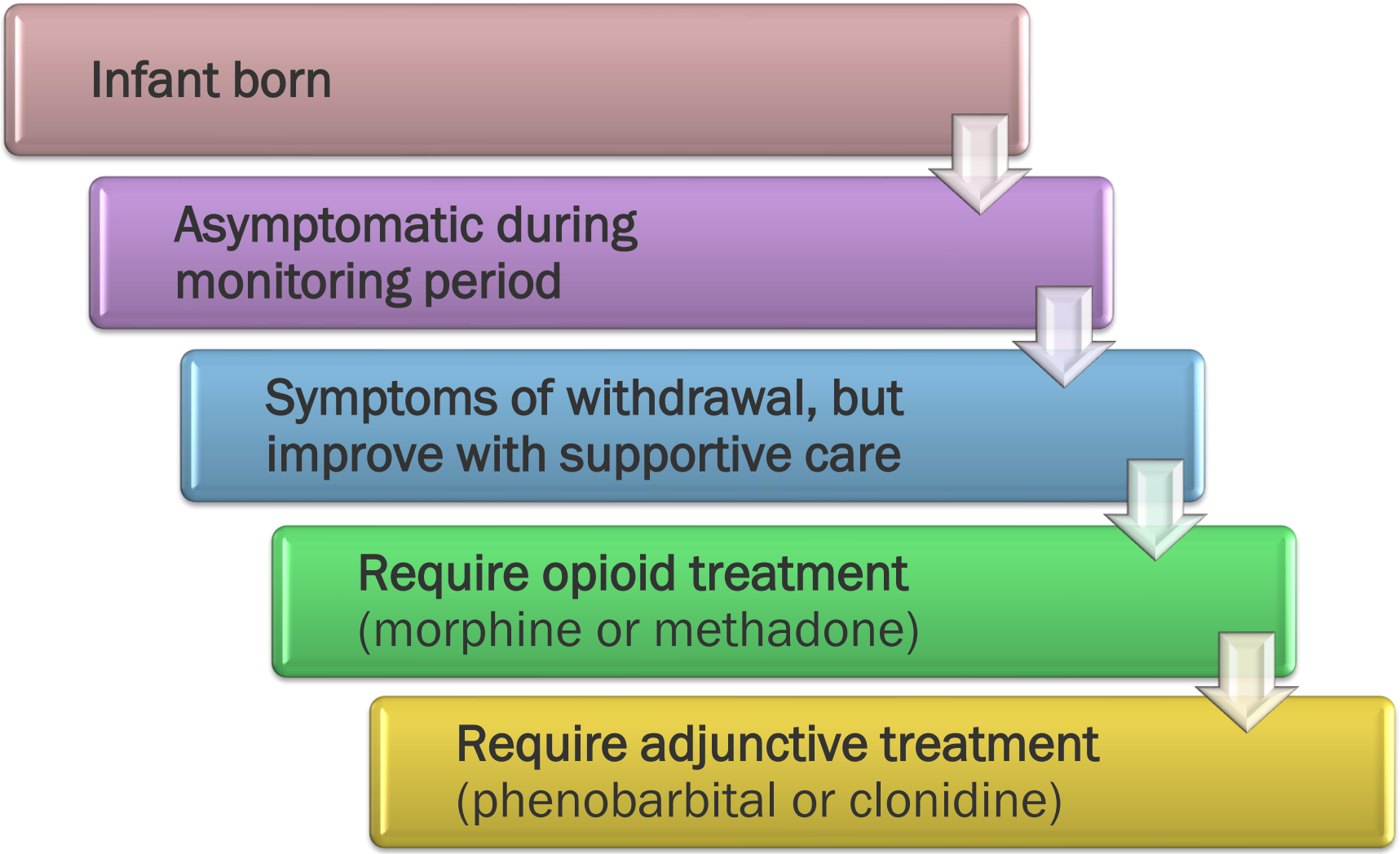
- Symptom onset depends on substance half-life
  - Heroin: 24 hours
  - Prescription short-acting opioids: 36-72 hours
  - Methadone/Buprenorphine: 72-96 hours (*can be delayed to 5-7 days)

Be realistic but hopeful with families



Baby will likely have some withdrawal symptoms, but not every baby will need medication

Interventions in opiate exposed infants



Chrissy and Jackson, DOL#1-2

- Finnegan scores remain in the 2-5 range
- Feeding:
  - Jackson gets scored for “poor sleep” at times when he is cluster feeding, which is NORMAL for a breastfeeding baby
  - Chrissy establishes good breastfeeding habits and starts pumping after breastfeeding to get her milk supply established more quickly
- Support
  - Chrissy’s sister is able to come and spend time supporting her and Jackson

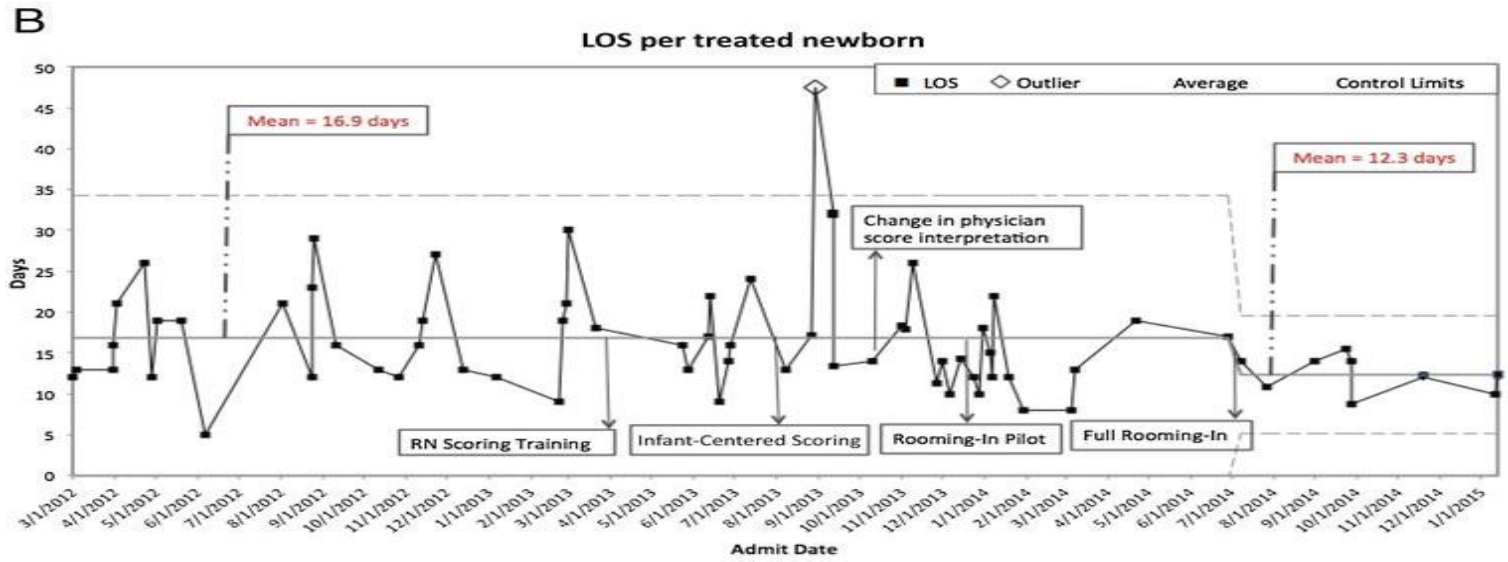
Family-Centered NAS care

- Newborns at risk for NAS remained with mother
  - Postpartum ward → Pediatrics ward
- "Infant-Centered Scoring"
  - Immediately after feeding while skin to skin
- Overall clinical picture evaluated
  - rather than just Finnegan score

Holmes 2016

Results of rooming-in

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



Holmes 2016

Original Investigation

ONLINE FIRST

February 5, 2018

Association of Rooming-in With Outcomes for Neonatal Abstinence Syndrome

A Systematic Review and Meta-analysis

Kathryn Dee L. MacMillan, MD[1,2]; Cassandra P. Rendon, BA, BS[2,3]; Kanak Verma, MPH[2,3]; et al

» Author Affiliations

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

Key Points

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.

Let families be involved

- Set expectations that parents should remain at bedside
  - Have moms identify a SUPPORT to stay as well
- Finnegan scoring sheets in the room
- Empower parents to be experts in supportive care
  - Encourage quiet, low stimulation, and limit visitors
  - Skin to skin
  - Swaddling
- Cluster care
  - Don’t wake a sleeping baby*

  (*Unless weight gain is a concern)

- Not only does this EMPOWER families, it also DECREASES the burden on unit staff

Chrissy and Jackson, DOL #3

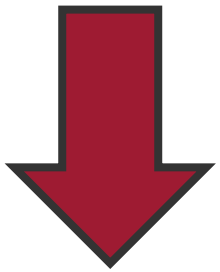
- Chrissy is discharged
  - Remains on unit, rooming in
- Jackson's weight is down ~10% from birth
  - Starts being supplemented with 10-15 ml of pumped milk after each breastfeed
- Finnegan scores are 7-8
  - Symptoms worsen around DOL #2-3

Breastfeeding and NAS

Maternal substance abuse

- Any maternal illicit drug of abuse is not compatible with breastfeeding
  - Mothers on methadone or buprenorphine should be encouraged to breastfeed if currently abstinent from any drug of abuse

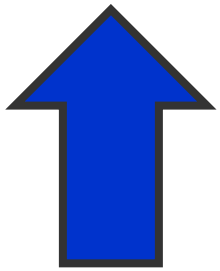
Exclusive breastfeeding and NAS



Finnegan scores

Infants required morphine

Length of stay



Supportive care for infant

Maternal bonding

Maternal stress relief

Abdel-Latif 2006

Breastfeeding support

- It is SAFE for mothers on maintenance meds
- Prenatal education/expectations
- Early skin to skin and lactation support
- If baby frantic/disorganized
  - Swaddle arms
  - Get milk flowing (hand expression/pumping)
  - Breast massage to maintain flow
  - Nipple shield
- Counsel mothers with hepatitis C

Bogen 2017

Chrissy and Jackson, DOL #4

- Chrissy remains rooming-in with Jackson
- Jackson's weight is stable on breastfeeding with EBM supplementation
- The nurse performs a Finnegan score in the treatment room and Jackson gets a 10
  - When returned to mom, Jackson immediately soothes and falls asleep
- Is that score of 10 valid?

Scoring systems – Modified Finnegan score

Scoring should be done after feeding, ideally skin-to-skin, respecting sleep

- Upper limit normal (95%)
  - **7** at 2 days old
  - **9** at 21 days old

Semi-objective with concerns for inter-observer reliability

SYSTEMS	SIGNS AND SYMPTOMS	SCORE	AM 2	4	6	8	10	12	PM 2	4	6	8	10	12	DAILY WT.
CENTRAL NERVOUS SYSTEM DISTURBANCES	High Pitched Cry	2													
	Continuous High Pitched Cry	3													
	Sleeps < 1 Hour After Feeding	3													
	Sleeps < 2 Hours After Feeding	2													
	Hyperactive Moro Reflex	2													
	Markedly Hyperactive Moro Reflex	3													
	Mild Tremors Disturbed	2													
	Moderate Severe Tremors Disturbed	3													
	Mild Tremors Undisturbed	1													
	Moderate Severe Tremors Undisturbed	2													
	Increased Muscle Tone	2													
	Excoriation (specify area): _____	1													
	Myoclonic Jerks	3													
	Generalized Convulsions	3													
METABOLIC VASOMOTOR/ RESPIRATORY DISTURBANCES	Sweating	1													
	Fever < 101°F (39.3°C)	1													
	Fever > 101°F (39.3°C)	2													
	Frequent Yawning (> 3-4 times/interval)	1													
	Mottling	1													
	Nasal Stuffiness	1													
	Sneezing (> 3-4 times/interval)	1													
	Nasal Flaring	2													
	Respiratory Rate > 60/min	1													
	Respiration Rate > 60/min with Retractions	2													
GASTROINTESTINAL DISTURBANCES	Excessive Sucking	1													
	Poor Feeding	2													
	Regurgitation	2													
	Projectile Vomiting	3													
	Loose Stools	2													
	Watery Stools	3													
SUMMARY	TOTAL SCORE														
	SCORER'S INITIALS														
	STATUS OF THERAPY														

Adapted from Finnegan L. Neonatal abstinence syndrome: assessment and pharmacotherapy. Neonatal Therapy: An update, F. F. Rubaltelli and B. Granti, editors. Elsevier Science Publishers B. V. (Biomedical Division). 1986: 122-146

Eat, Sleep, Console?

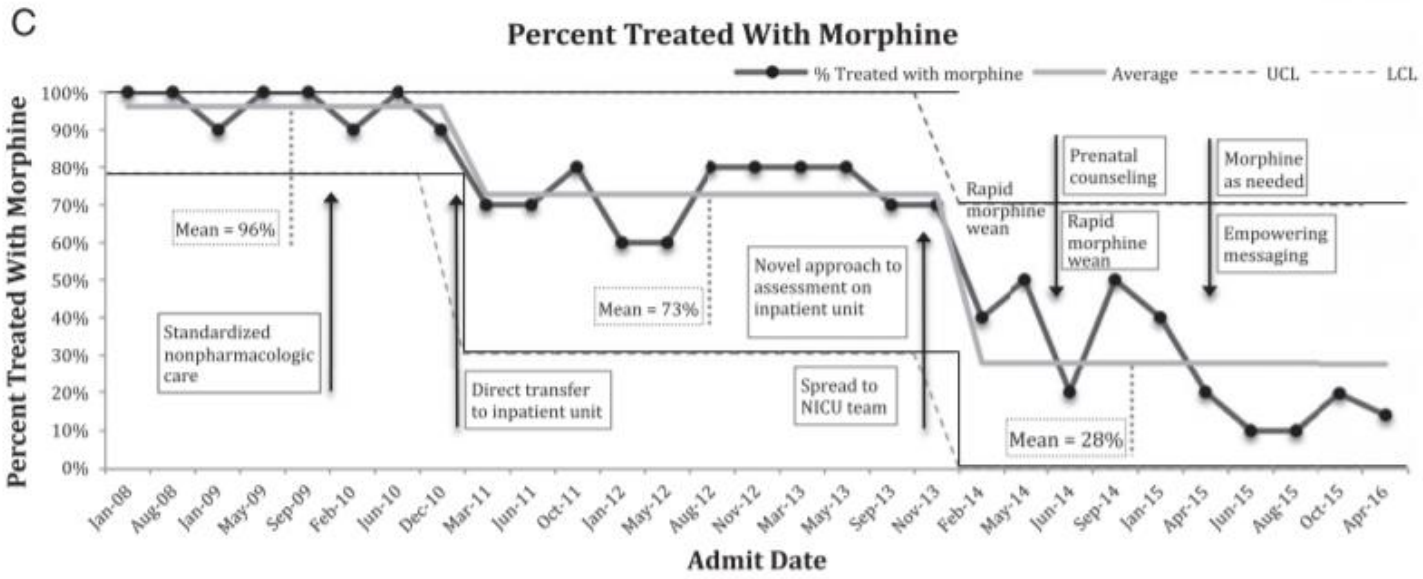
An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome

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

- Can the baby breastfeed effectively or take > 1 oz from the bottle?
- Can the baby sleep for > 1 hour undisturbed?
- Can the baby be consoled within 10 minutes?
- **If yes – no morphine!**

Grossman 2017

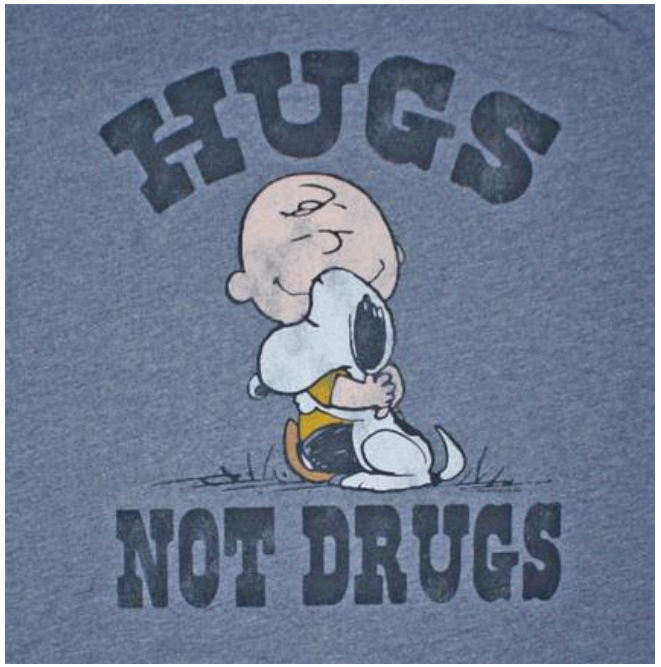
Eat, Sleep, Console?



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

Grossman 2017

Paradigm shift



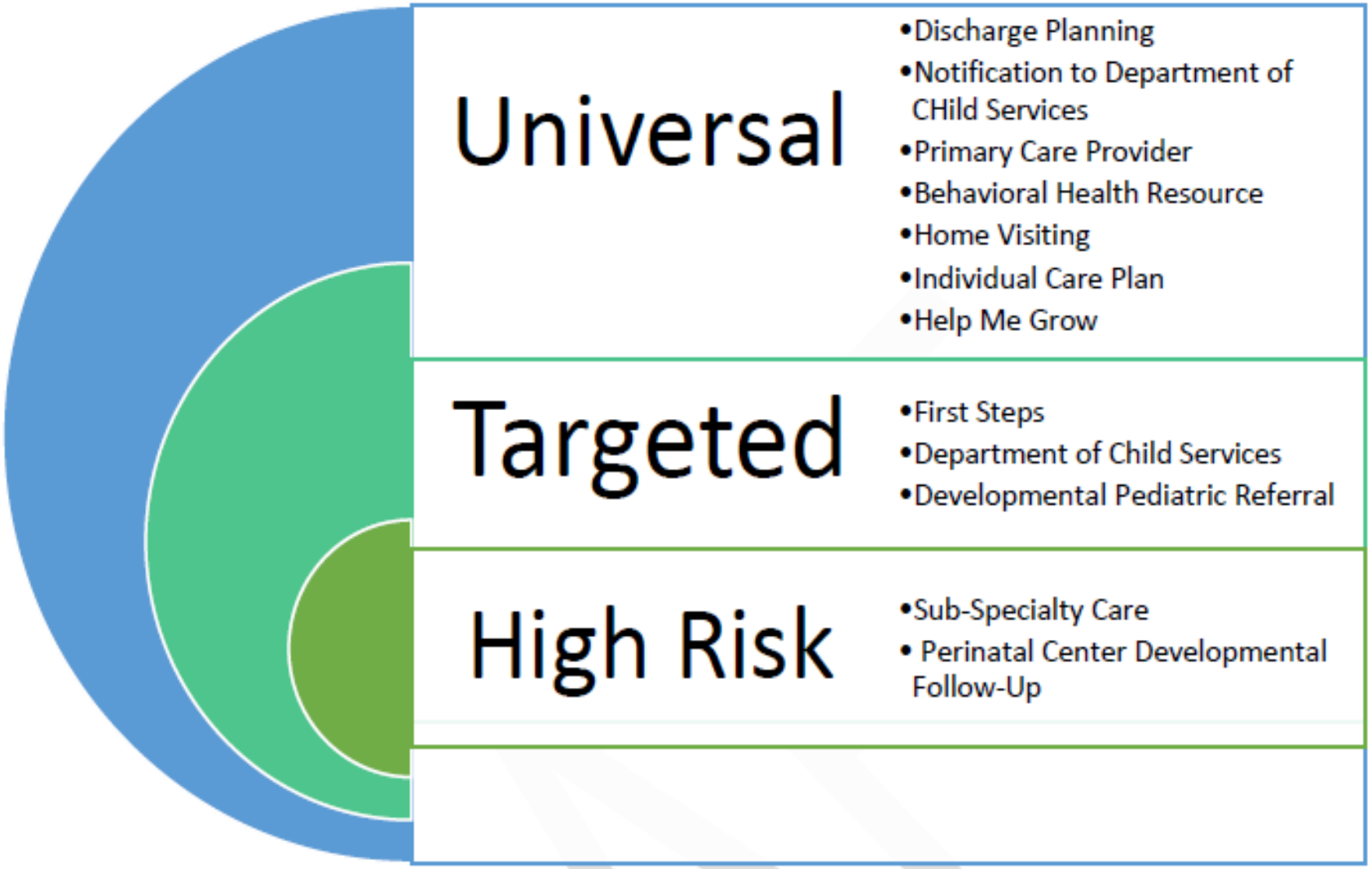
Families (optimal supportive care) are the **first line** therapy for neonatal abstinence syndrome

Chrissy and Jackson, DOL #5

- Jackson gains 25 grams
- His Finnegan scores remain ~7
- He is feeding well, sleeping about 2 hours between feeds, and is easily consoled by his mother
- His is discharged home from the hospital, and sees his primary care doctor the following day

Outcomes of NAS and outpatient follow-up

RESOURCES AND SUPPORTS NEEDED



Know your family's plan at discharge

- Who will be in the home?
- Who is mom's support?
- What support services are already in place?
- Is mom going to be weaning off her maintenance medication soon?

Outcomes: Visual

Am J Ophthalmol. 2013 Jul;156(1):190-4. doi: 10.1016/j.ajo.2013.02.004. Epub 2013 Apr 28.

The short- and long-term effects on the visual system of children following exposure to maternal substance misuse in pregnancy.

Spiteri Cornish K[1], Hrabovsky M, Scott NW, Myerscough E, Reddy AR.

J Pediatr Ophthalmol Strabismus. 2012 Jan-Feb;49(1):58-63. doi: 10.3928/01913913-20110308-01. Epub 2011 Mar 15.

Nystagmus and reduced visual acuity secondary to drug exposure in utero: long-term follow-up.

Gupta M[1], Mulvihill AO, Lascaratos G, Fleck BW, George ND.

J Pediatr Ophthalmol Strabismus. 2012 Jul-Aug;49(4):236-41. doi: 10.3928/01913913-20120207-02. Epub 2012 Feb 14.

An assessment of ocular morbidities of children born prematurely in early childhood.

Goktas A[1], Sener EC, Sanac AS.

Outcomes: Cognitive & Developmental

- Conflicting data
  - Some studies found persistently lower levels of cognitive functioning and lower developmental scores than age-matched controls
  - Other studies show controlling for **socioeconomic** factors (caregiver years of education etc) showed no difference between the groups.
  - Limited data on buprenorphine and patients from our current “opioid epidemic”
  - Are outcomes determined by a child having NAS, or the ongoing environmental factors? Or both?

Outcomes: Risks to wellness

- Children who were opiate exposed are **2.5** times more likely to be readmitted to the hospital in the first month after discharge home
- Throughout their childhood, more likely to be admitted for:
  - Assaults
  - Maltreatment
  - Accidental poisoning
  - Mental/behavioral health disorders
  - Visual disorders

Patrick 2015

IPQIC guidelines

- Home nursing visits for all NAS babies
- First steps referrals
  - Not necessarily at the time of discharge
  - Hypertonicity screenings at 6 months
- Ophthalmology referrals
  - If abnormalities on exam
- Postpartum depression, developmental, and social determinants of health screenings
- Hep C screening at 2-4 and 18 months (if applicable)

Screening Recommendations for Substance Exposed Children

Visit	Social Determinants Screening	Maternal Depression Screening	Developmental Surveillance	Developmental Screening Tool (ie. ASQ-SE)	Vision Surveillance Strabismus Screening [2]	Hep C Evaluation	Age-Specific Recommendations
Initial [1]	X						Weight, jaundice check
2 week	X						Growth monitoring
1 month	X	X	X				Growth monitoring
2 month	X	X	X				Growth monitoring
4 month	X	X	X			X	Hep C RNA PCR (if indicated)
6 month	X	X	X		X		Evaluate for hypertonicity[3]
9 month	X			X	X		Auditory evaluation [4]
12 month	X		X		X		
15 month	X		X		X		
18 month	X			X	X	X	Hep C Ab, RNA PCR (if indicated)
24 month	X			X	X		
4-6 year	X		X		X	X	School Readiness Screening [5]

[1] First visit should be within 72 hours of discharge from hospital. [2] For any vision concerns or strabismus on exam, refer to Pediatric Ophthalmology. [3] For any hypertonicity on exam after 6 months, refer to First Steps for physical therapy +/- occupational therapy. [4] For infants diagnosed with NAS or those admitted to the NICU. [5] For behavior/development concerns, refer to public school-based services and may refer to Developmental/Behavioral Pediatrics.

INDIANA PERINATAL QUALITY IMPROVEMENT COLLABORATIVE [IPQIC]

Supporting the Family

Supporting the dyad: Addiction – crime or chronic illness?

- JAMA, 2000
  - Literature review compared drug dependence with chronic illnesses:
    - Type II diabetes
    - Asthma
    - Hypertension
  - 40-60% treated returned to substance use within one year following treatment discharge
  - 30-50% adults with type II diabetes
  - 50-70% of adults with hypertension or asthma experience recurrence of symptoms each year

McLellan 2000

Supporting the dyad: Recognizing biases

- Maternal factors:
  - Previous experiences with healthcare providers
  - Guilt, anxiety, blame
  - Maternal substance use/ mood disorders, adverse childhood experiences (ACEs)
    - Interpretation of newborn cues
    - Affect response to these cues
- Healthcare providers:
  - Generalize based on previous experiences
  - Burnout prevents attachment
  - Anchoring bias
    - Easier to accept data that fits our own narrative

Fraser 2006

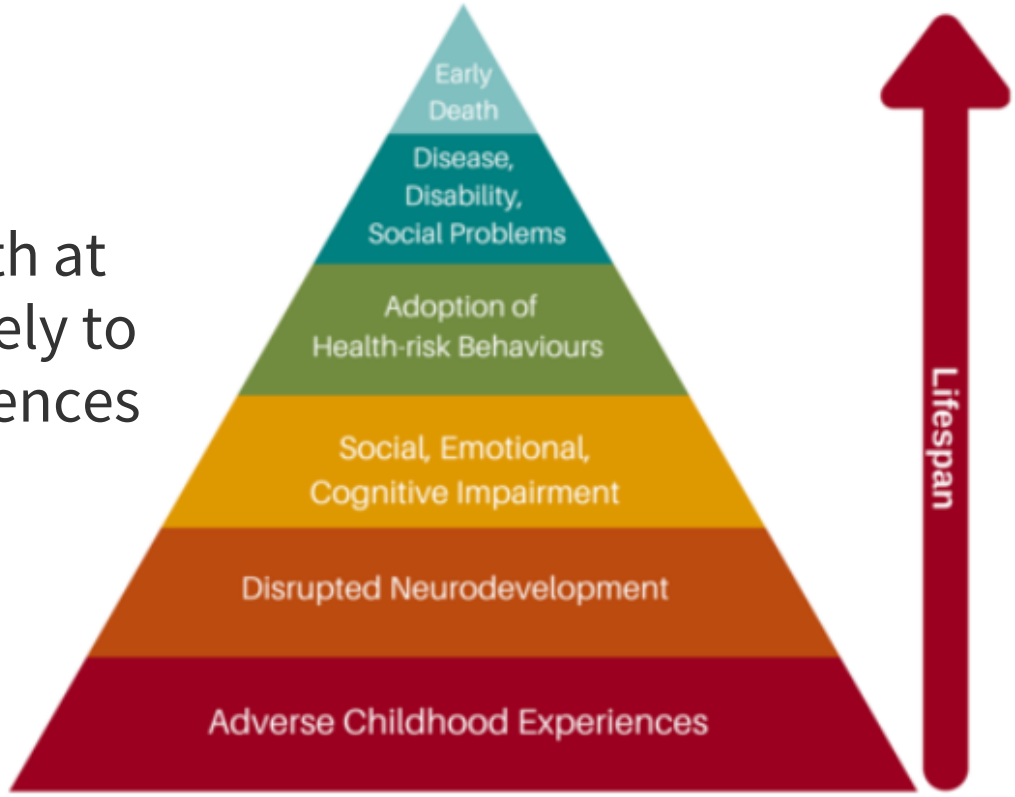
Adverse childhood experiences (ACE's)

- 50% of all kids in Indiana have at least 1 ACE
- 20% have two or more

Adverse childhood experiences (ACE's)

> **Adverse childhood experiences are the single greatest unaddressed public health threat facing our nation today**
>
> Dr. Robert Block, the former President of the American Academy of Pediatrics

Children raised by a parent with at least 1 ACE are **1000x** more likely to have their own adverse experiences



Explicit vs Implicit biases

Explicit Bias

- Aware
- Voluntary
- Intentional

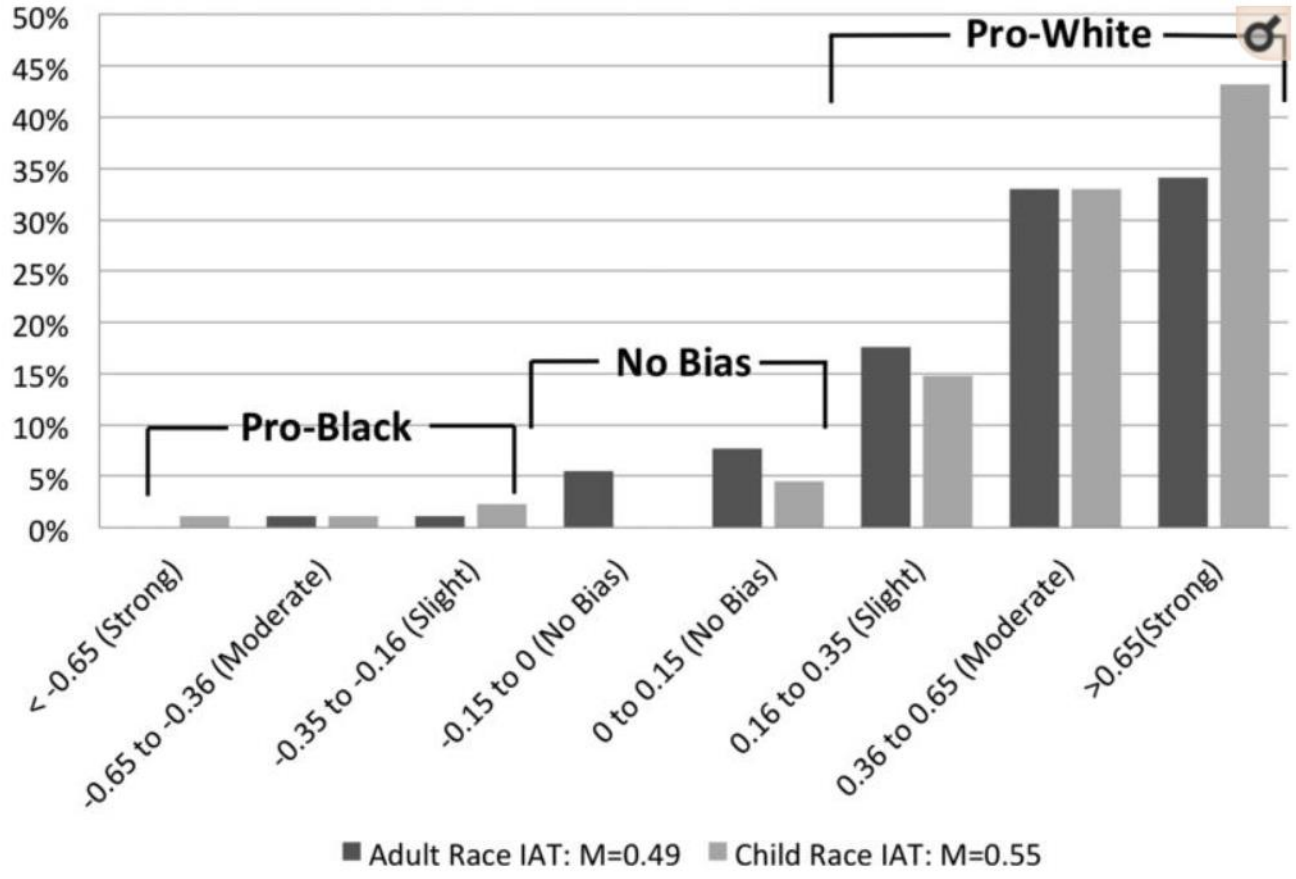
Implicit bias

- Unaware
- Involuntary
- Unintentional

Implicit bias among healthcare professionals

- We’re altruistic…
- We’re noble…
- We have similar rates of bias as the general population

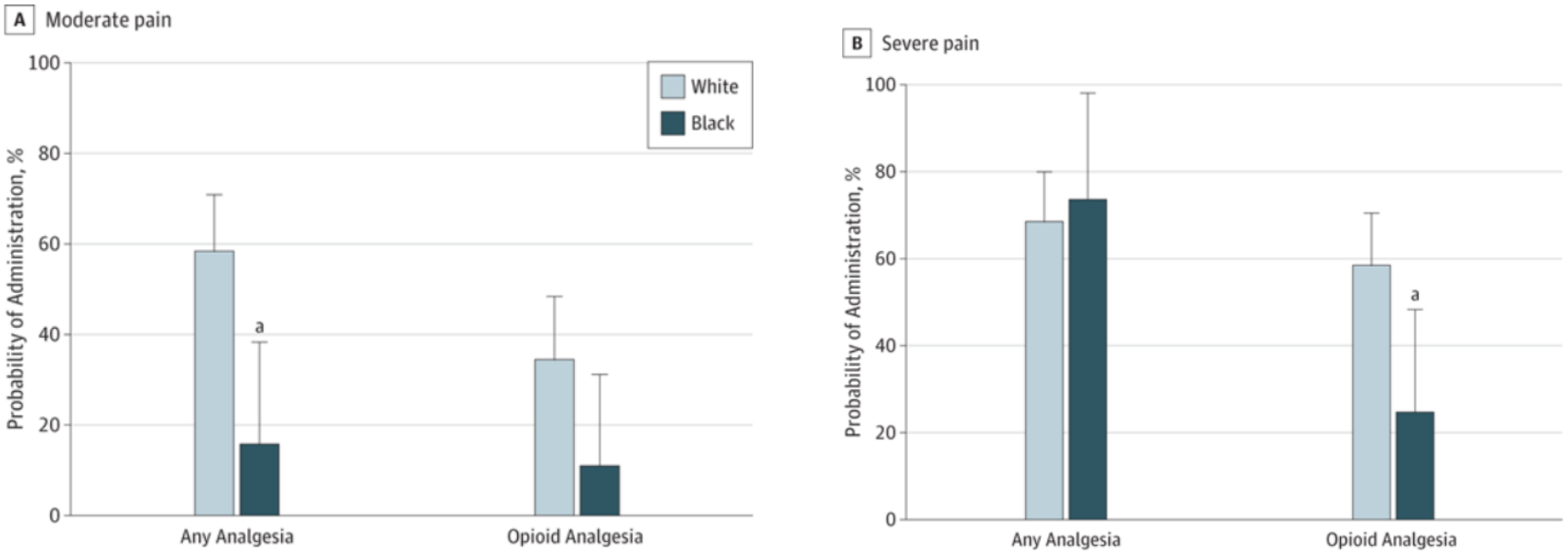
Implicit bias among **pediatric** residents



Johnson 2017

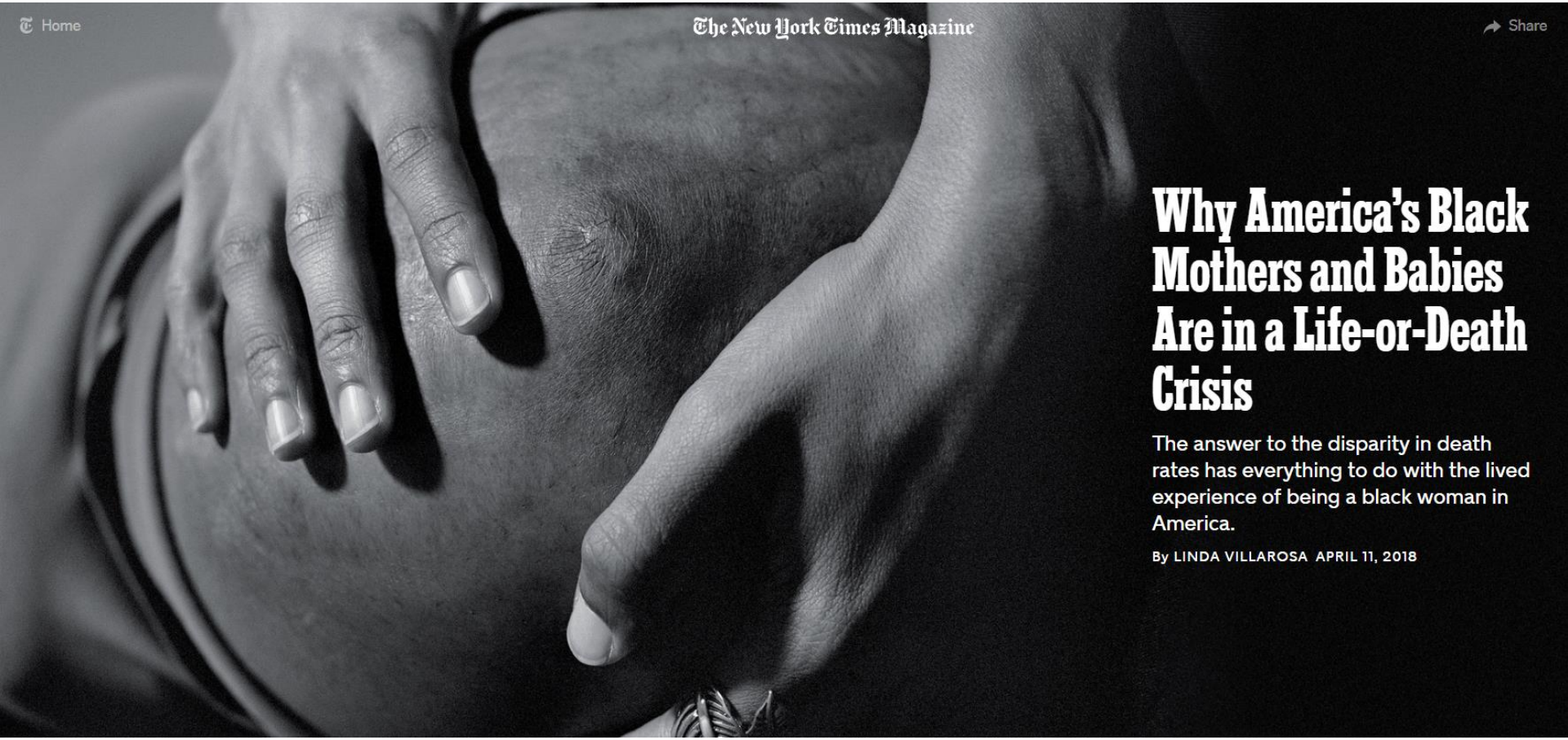
Implicit bias affecting health care delivery

Pain management in children with appendicitis



Goyal 2015

The New York Times Magazine



Why America's Black Mothers and Babies Are in a Life-or-Death Crisis

The answer to the disparity in death rates has everything to do with the lived experience of being a black woman in America.

By LINDA VILLAROSA APRIL 11, 2018

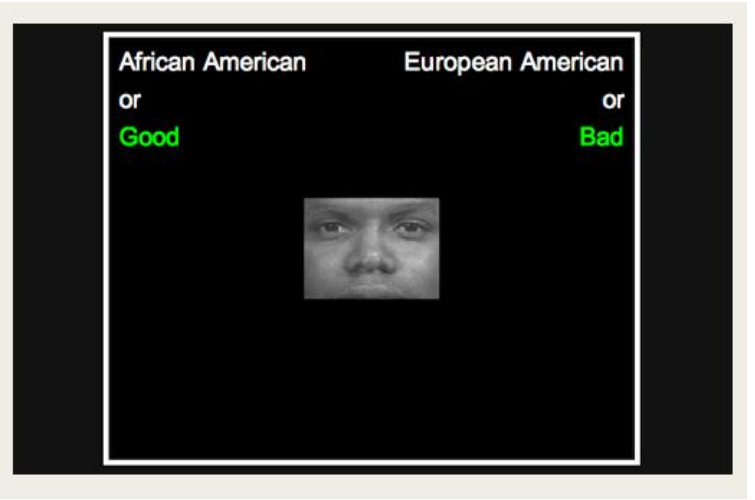
How does implicit bias affect the care of our moms and babies affected by opioid use disorder?

What can we do about this?

- Acknowledge that implicit bias exists
  - Everyone has it
  - No one should be embarrassed or shamed
  - We probably can't make it go away
  - We must work to mitigate the effects of implicit bias in healthcare
- Use tools to drive a discussion on your unit

Harvard Implicit Bias Test

- Goal – to capture unconscious connections between groups and assigned values
- Works by measuring the time for the subject to match a social group with a positive or negative attribute
- Available for: race, gender, sexual orientation, weight, disability status



implicit.harvard.edu

Strategies

- Be mindful/reflect on the role implicit bias plays in patient encounters
- Have patients TELL YOU how they felt treated on your unit
  - Highlight positive interactions in discussions/staff meetings
- Spend time with your patients affected by substance use disorder
  - Have a meaningful conversation about their substance use and recovery
- Role modeling/role playing and directed readings

Source: The Washington Times

“It is time for us to reshape how we view addiction in the US. It is a medical condition – not a moral failing.”

- Stephen Patrick, MD

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