

# **Neonatal Abstinence Syndrome (NAS): Understanding the past, present, and future in clinical practices to support infants and their caregivers**

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## Learning Objectives

By participating in the symposium, attendees will be able to:

- Define and understand Neonatal Abstinence Syndrome and who is affected by it
- Identify and be educated on effective and available interventions
- Demonstrate ways they can support children and families affected by NAS

# About UNC Horizons

- UNC Horizons is an integrated substance use disorder treatment program for women, including those who are pregnant, parenting, and/or whose lives have been touched by abuse and violence.
- We have 30 apartments where our clients reside for 9 months with up to three of their children.
- We provide prenatal care, psychiatry, pediatric care, childcare, adult and child assessment and treatment, case management, job training, etc.





# About me:

- Have worked at UNC Horizons for over 10 years
- Director of Child Clinical Services
- Supervise child psychologists completing their year of internship for their doctoral program
- Infant Mental Health Mentor
- Play therapy Supervisor
- Trained in multiple evidence-based interventions for children and families including: Circle of Security Parenting, Child Parent Psychotherapy, Trauma Focused CBT, Parent Child Interaction Therapy, and Attachment and Biobehavioral Catch Up.
- Served on March 2021 U.S. Department of Health and Human Services National Convening on Substance Exposure in the Mother-Infant Dyad.



# Important Definitions

- **Neonatal Abstinence Syndrome (NAS)** - recognized as a constellation of clinical signs of withdrawal that may occur in neonates after in utero exposure to opioids **and other substances** (Finnegan, et al., 1975) **such as:**
  - Tobacco
  - SSRI's
  - CNS Depressants, such as Benzodiazepines, Alcohol, Barbiturates.
  - CNS Stimulants, such as amphetamines or cocaine
- **Neonatal Opioid Withdrawal Syndrome (NOWS)** - Between 2013 and 2016, the US Food and Drug Administration introduced new terminology designating neonatal opioid withdrawal syndrome (NOWS) as the specific neonatal withdrawal from opioids. (FDA.gov)



# NAS History

Treatment initially largely focused on mothers with heroin addiction with opioid agonists

- 1960s: Methadone created
- 1975: NAS defined in the literature (Desmond & Wilson)
- 1975: Neonatal Abstinence Scoring Syndrome (NASS) was developed (Finnegan et al)
  - 20 most common signs of withdrawal ranked into groups of increasing severity
  - 32 items requiring scores
  - Multiple variations of assessment instrument
  - Extensive training needed
  - No studies on specificity or sensitivity
  - Emphasis on controlling withdrawal, not overall outcome for infants or dyads



# NAS/NOWS clinical definition

Clinical criteria for diagnosis consists of the presence of clinical elements 1 and 2:

- 1. *In utero exposure to opioids with or without other psychotropic substances***  
(recommended to be collected via confidential maternal self-report; toxicology also acceptable with maternal informed consent)
- 2. *Clinical signs – characteristic of substance withdrawal, any two signs qualify:***
  - Excessive/continuous crying (easily irritable)
  - Fragmented sleep (<2-3 h after feeding)
  - Tremors (disturbed or undisturbed)
  - Increased muscle tone (stiff muscles)
  - Gastrointestinal dysfunction (hyperphagia, poor feeding, feeding intolerance, loose or watery stools)

Jilani SM, Jordan CJ, Jansson LM, Davis JM. Definitions of Neonatal Abstinence Syndrome in Clinical Studies of Mothers and Infants: An Expert Literature Review. J Perinatol. 2021 Jun;41(6):1364-1371. doi: 10.1038/s41372-020-00893-8.



# NAS/NOWS is NOT ADDICTION:

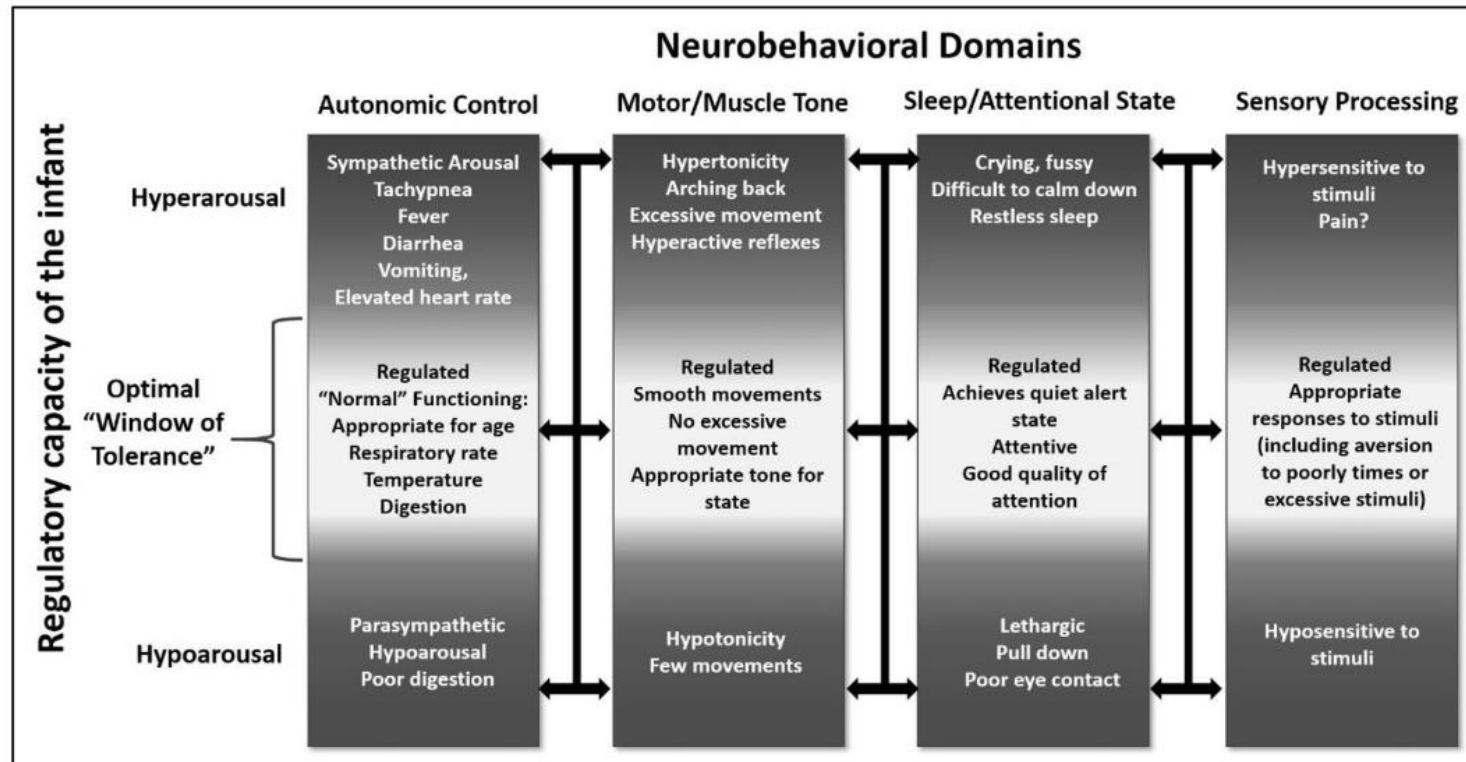
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- Newborns can't be “born addicted”
- NAS is withdrawal – due to physical dependence
- Physical dependence is not addiction
- Addiction is brain illness whose visible signs are behaviors
- Newborn do not have the life duration or experience to meet the addiction definition



# NAS/NOWS presentation:

- Symptoms develop in first 48-72 ++ hours after birth
- Significantly variable presentation
- Dysregulation observed in 4 neurodevelopmental domains:



Velez, Jordan, and Jansson, 2021



# Long term outcomes of NAS/NOWS?

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- NAS/NOWS is not Fetal Alcohol Syndrome (FAS/FASD)
- NAS/NOWS is treatable
- NAS/NOWS and its treatment are not known to have long-term effects; interactions between the caregiver and child can impact resiliency/risk with potential long-term effects in some cases.

# Treatment for NAS/NOWS

- Originally, infants put in NICU, often away from caregiver with monitored tapered dosing of a medication to ease symptoms (morphine, methadone, clonidine)
- Medication centered
- Average length of stay ~16 days - Unchanged between 2000-2009
- • Total hospital charges for newborns with NAS
  - 2000: \$190 million
  - 2009: \$720 million (adjusted for inflation)
- \$93,000/infant for NAS hospitalization requiring pharmacotherapy
- Separation of dyad in early post-natal life associated with:
  - Poor attachment and bonding
  - Decreased breastfeeding rates
  - Disturbed infant emotional and cognitive development and self-regulation skills
  - Increased rates of readmission, loss of parental rights, formula feeding

Sullivan et al. Infant bonding and attachment to the caregiver: Insights from basic and clinical science. *Clin Perinatol.* 2011 Dec; 38(4): 643–655.



# Treatment for NAS/NOWS

- Hospitals begin “Rooming In” infants with their caregiver. (Holmes et al., 2016)
- Focus on non-pharmacological interventions, such as:
  - Low stimulation environment
  - Non-nutritive sucking
  - Skin-to-skin placement
  - Breastfeeding
  - Caloric supplementation
- Results
  - ↓morphine-treated infants (46% to 27%)
  - ↓morphine dose in treated infants (14 mg to 7 mg)
  - ↓average length of stay (16.9 days to 12.3 days)
  - \$11000 average cost savings per treated infant
  - No change in readmission or adverse events



# Eat, Sleep, Console (ESC) Model for treating NAS/NOWS

- Interventions:
  - Non-pharmacologic care
  - Including formula fortification up to 24 kcal/oz
  - Management on floor with rooming-in
  - PRN Morphine
- Novel Assessment for NAS - ESC
  - **Eat:** 1 ounce per feeding
  - **Sleep:** 1 hour between feedings
  - **Console:** within 10 minutes when crying

## Results:

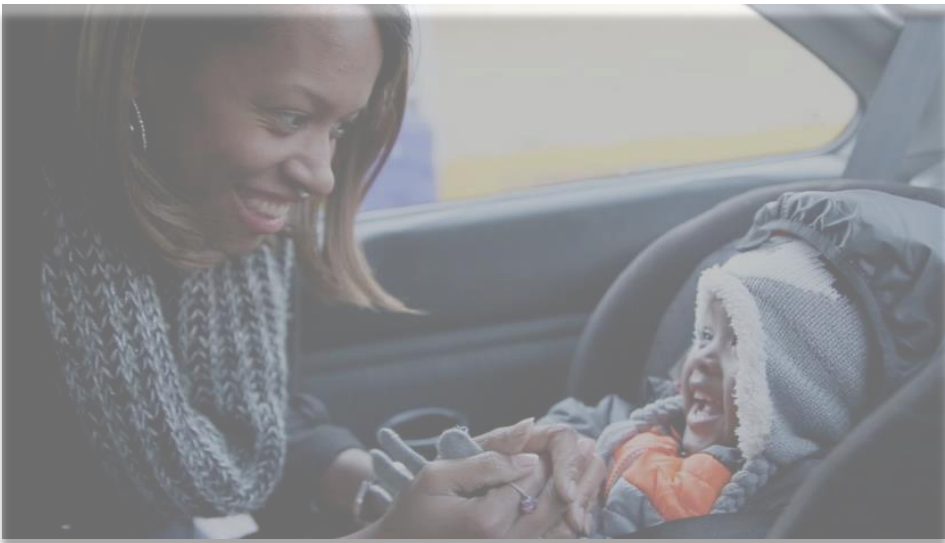
- ↓ LOS from 22.4 to 5.9 days
- ↓ cost by >\$30,000 per infant
- ↓ morphine treatment from 98% to 14% of exposed infants

Grossman, M. R., Lipshaw, M. J., Osborn, R. R., & Berkwitt, A. K. (2018). A novel approach to assessing infants with neonatal abstinence syndrome. *Hospital Pediatrics*, 8(1), 1-6.





# Coming Home: Supporting infants with NAS/NOWS histories through a *Dyadic Model of Care*

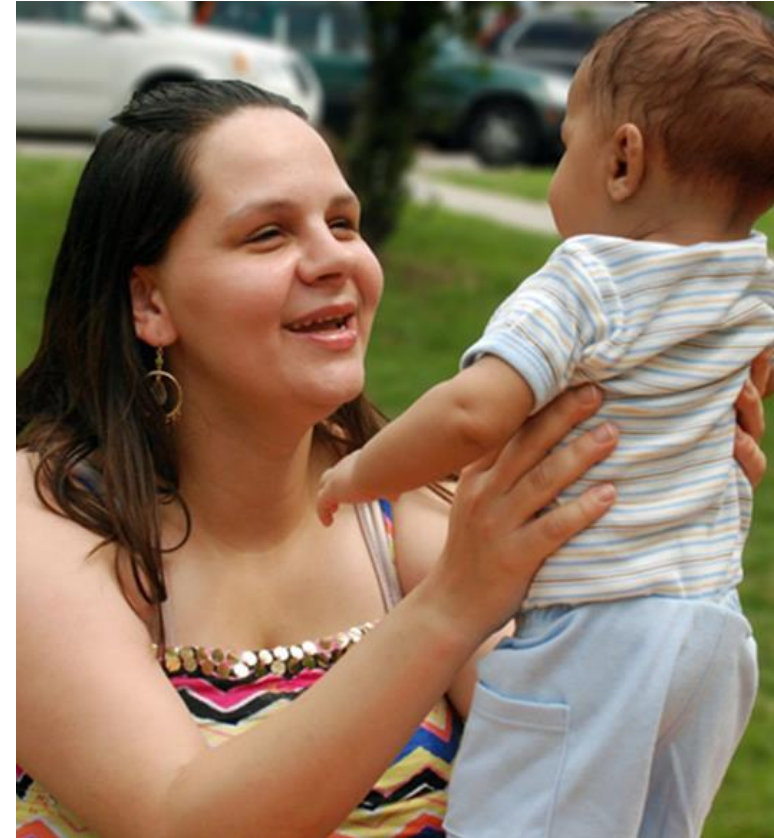


- The postpartum period is a high-risk time for relapse
  - Pain related to delivery
  - Changes in relationships with partners and other family members
  - Increased stress levels caused by lack of sleep, hormonal changes, and the demands of parenting
  - Interactions with child welfare agencies, courts, and criminal justice agencies
  - Ambivalence about parenting
  - Other stressors of daily living

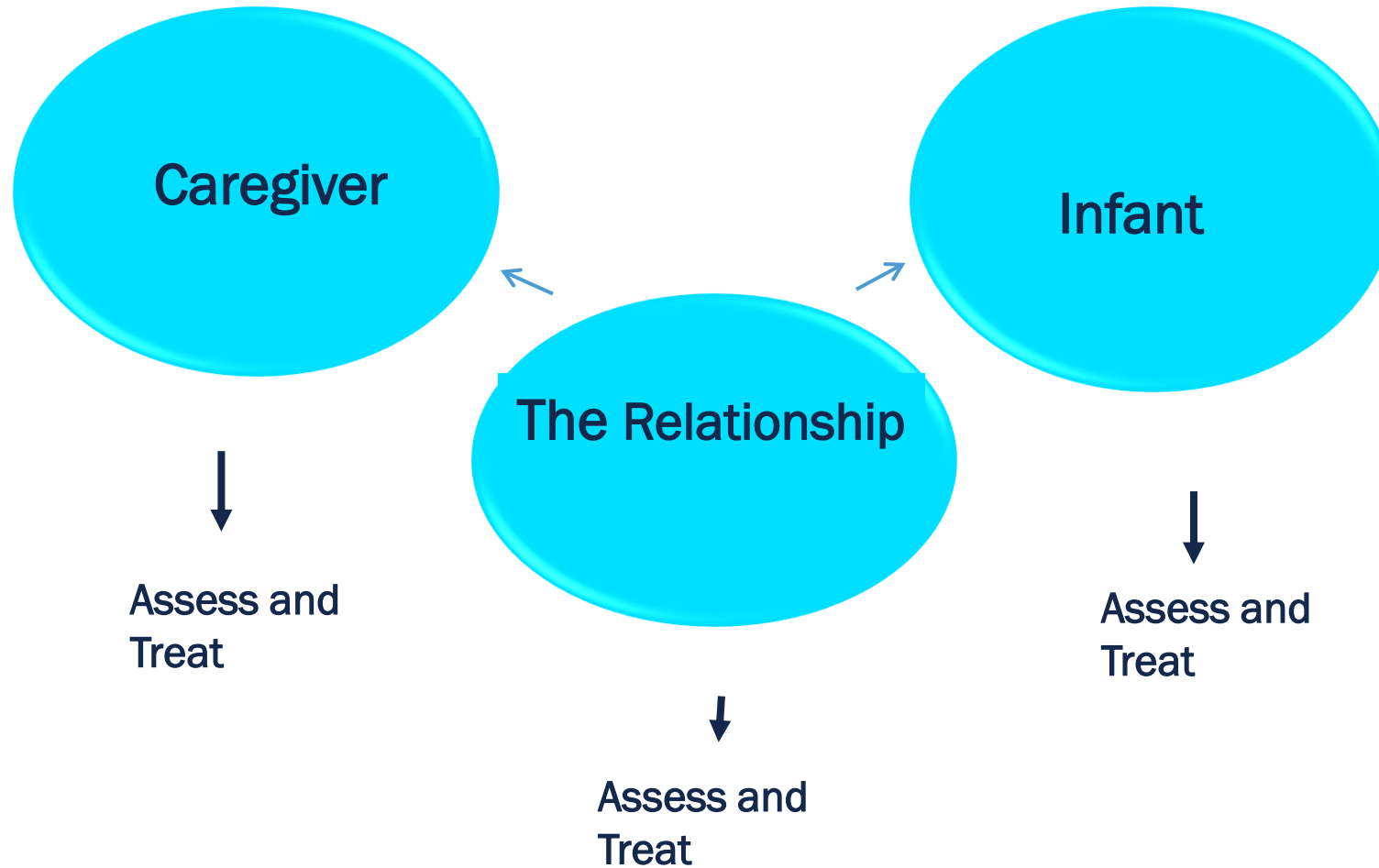


# What is Attachment? A Dyadic Relationship?

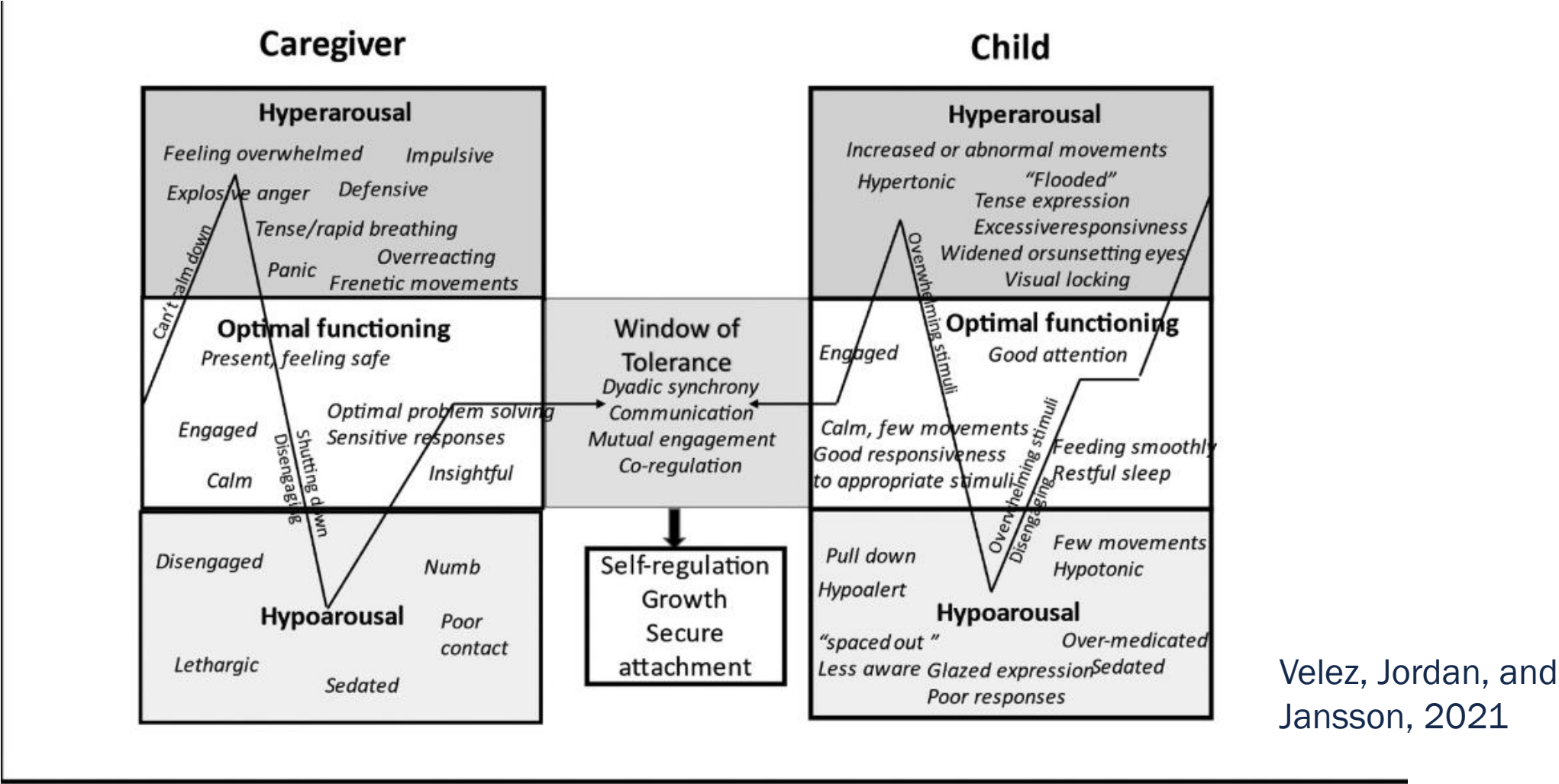
- Social and Emotional Exchanges
- Reciprocal
- Can be “healthy” or “unhealthy”
- Quality Matters!
- Developmental perspective
- Attachment = History of a dyadic relationship
  - Secure, Insecure, Disorganized
- *Infant Mental Health*



# Horizons Dyadic Model of Care: Assessment



# Optimal arousal zone or “window of tolerance” in the dyad exposed to substances.



# UNC Horizons Dyadic Model of Care

- Visit from infant/child therapist within first week of delivery, even if in NICU
- Multiple home visits first 2 weeks
- Continue modified Eat, Sleep, Console model of care for home care
- Breast/chest feeding is recommended for birthing parents prescribed buprenorphine and methadone.
- Velcro swaddlers are your friend 😊
- Safe sleep practices
- Extended skin-to-skin contact with birthing parent is recommended.
- Mothers and infants rooming together at hospital is associated with reduced need for medication and shorter hospital stays.
- Focus on infant strengths, learning infant cues, developmental guidance
- Assess milestones monthly; refer to early intervention if needed







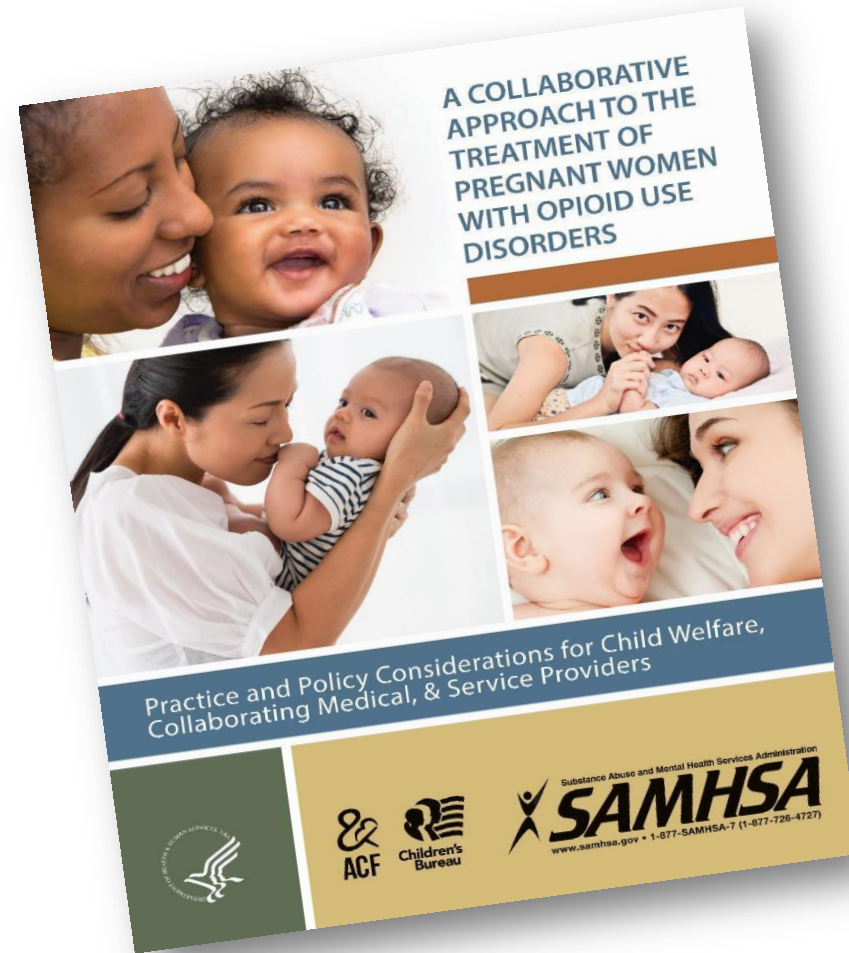
Photo from Pixabay

# Questions?

The University of North Carolina at Chapel Hill



# Resources



- **Purpose:** Support the efforts of States, Tribes and local communities in addressing the needs of pregnant women with opioid use disorders and their infants and families
- **Audience**
  - Child Welfare
  - Substance Use Treatment
  - Medication Assisted Treatment Providers
  - OB/GYN
  - Pediatricians
  - Neonatologists
- **National Workgroup**
  - 40 professionals across disciplines
  - Provided promising and best practices; input; and feedback over 24 months.



# Resources



← RESOURCES →



<https://store.samhsa.gov/>

# References

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