

# Neonatal Abstinence Syndrome: The Opioid Epidemic Explained and Treated Through Attachment.

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# OUTLINE

1. Attachment Theory
2. Connection between attachment and addictions
3. Neurodevelopment of the infant
4. Treatment and Prevention through attachment

Over 90% of female opioid users  
are of childbearing age.

## An Intergenerational Story:

- Attachment insecurity (ages 0-2)
- Adverse Childhood Experiences (ages 0-18)



# Attachment Theory

# John Bowlby, MD



**“Maternal Care  
and  
Mental Health”  
-1950**

# Mary Ainsworth, PhD



*"Patterns of attachment: A psychological study  
of the Strange Situation."*

*-1978*

# Secure Attachment

- **Secure Attachment**: defined as the ability to carry a representational model of attachment figures as being available, responsive, and helpful. Show some distress when caregivers leave, but are able to compose themselves knowing the caregiver will return. They are easily soothed when the caregiver returns.

# Insecure Attachment

- **Insecure attachment** is defined as not seeking out the attachment figure when distressed or have difficulty moving away from the caretaker, likely due to having an unresponsive, rejecting, inconsistent or insensitive caretaker.
  - **Anxious Attachment**: Extreme distress when left by the caregiver, want to be comforted, want to punish caregiver for leaving them, difficult being soothed.
  - **Avoidant Attachment**: Do not appear distressed by being left by the caregiver, avoid seeking contact upon reunion, turning attention elsewhere.

# Adverse Childhood Experiences (ACE)

- History of **verbal, physical, and sexual abuse** increase likelihood of:
  - Smoking
  - EtOH use
  - Illicit drug use
- Increasing number of ACE events:
  - Substance use begins at an earlier age
  - Consequences are worse (psychosis, homelessness, etc.)

# Attachment: Addictions

Is there a connection???

# Attachment and Substance Abuse

- 208 adopted individuals
  - Assessed for lifetime substance abuse disorders
  - Assessed for substance abuse treatment participation
  - Assessed for attachment security
- **Anxious** and **Avoidant** attached were more likely to have **substance abuse** history.
- **Avoidant** attached were **less** likely to engage in **treatment**.

# College students

- Insecure attachment leads to:
  - Increased EtOH consumption
  - Increased marijuana use
  - Increase cigarettes smoking
- To relieve stress from fears of abandonment

# Attachment Style and Treatment Completion

- 187 dual diagnosis patients admitted to 42 day inpatient treatment
- Ages 18-66
- 29% discontinued treatment early
- 71% completed treatment
- **Predictors of Treatment Completion:  
Preoccupied (anxious) Attachment Style**

# Insecure Attachment

Poor  
Mental  
Health

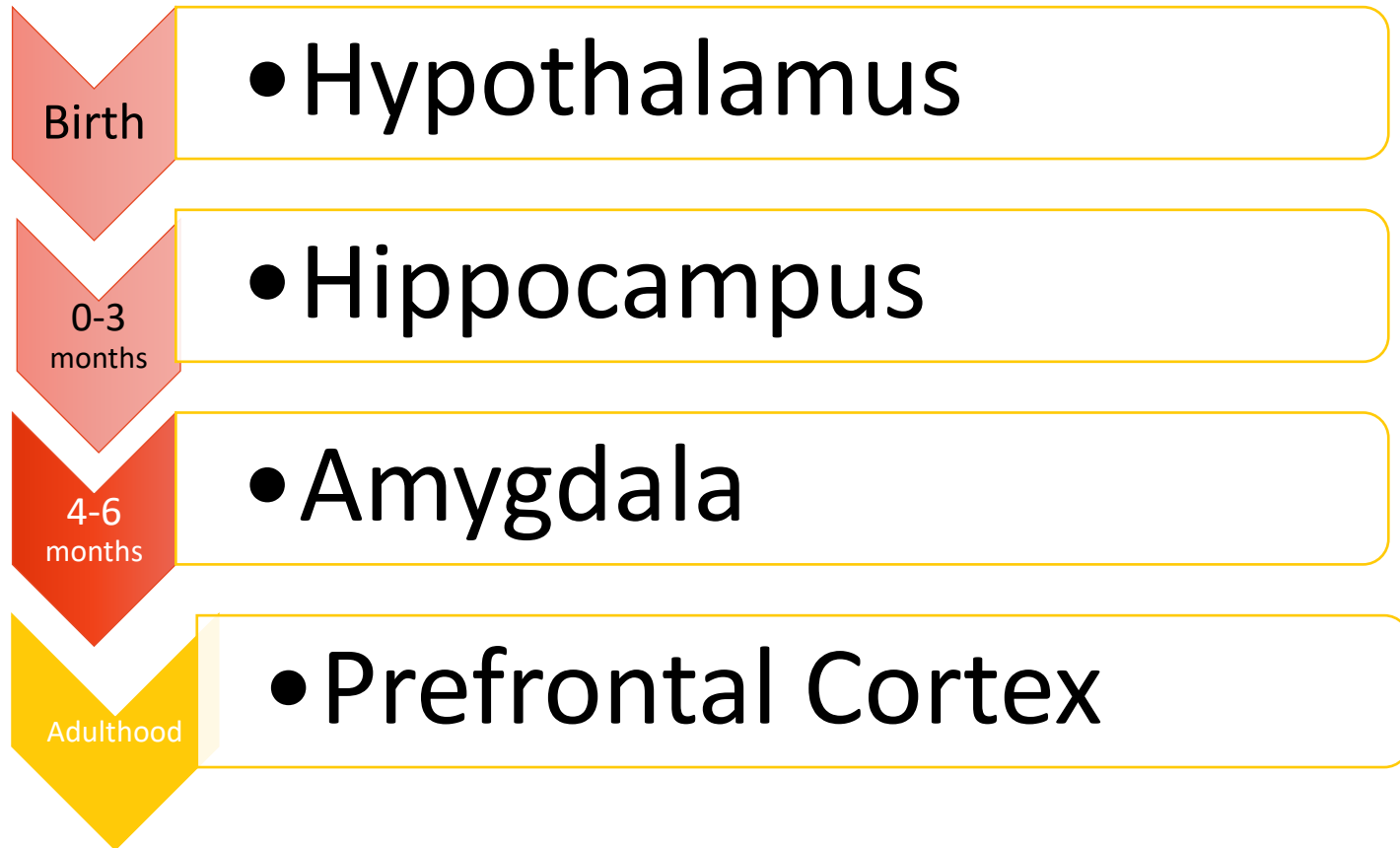
- Addictions
- Depression
- Anxiety
- Eating Disorders
- Personality Disorders

# Neurodevelopment

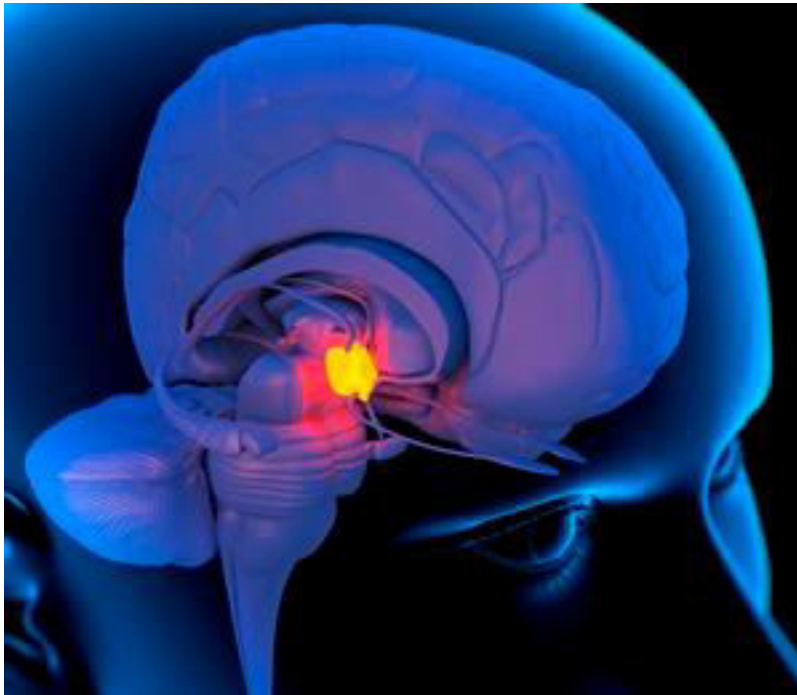
# An Intergenerational Story:



# Neurobiology of Attachment: Infants



# Hypothalamus



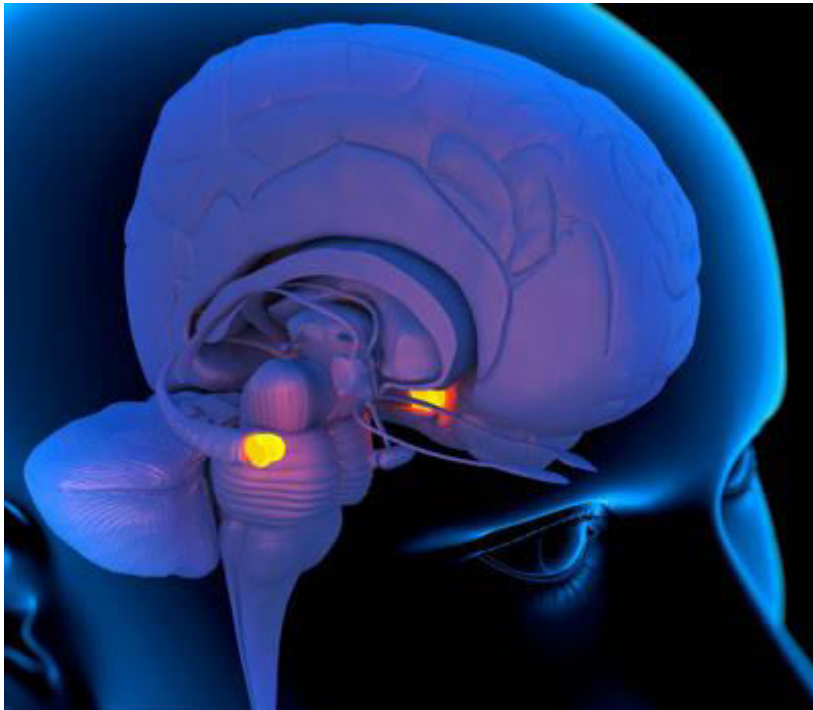
- **Corticotropin-releasing hormone**
- **Oxytocin**
- **Dopamine**
- Thyrotropin–releasing hormone
- Growth hormone-releasing hormone
- Somatostatin
- Gonadotropin-releasing hormone
- Vasopressin

# hippocampus



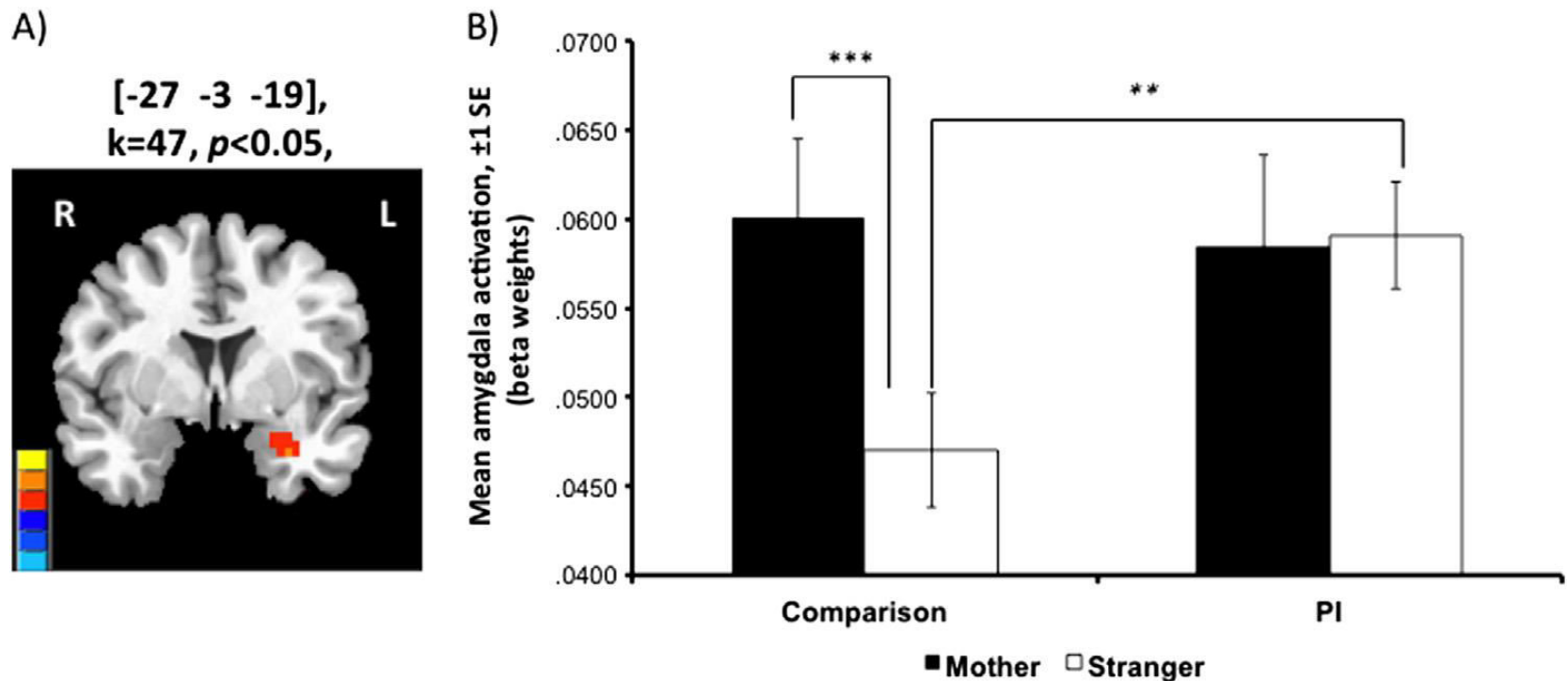
- **Memory consolidation**
- **Learning**
- **Emotions** (limbic system)
- **Spatial Orientation**
- **Navigation**

# amygdala

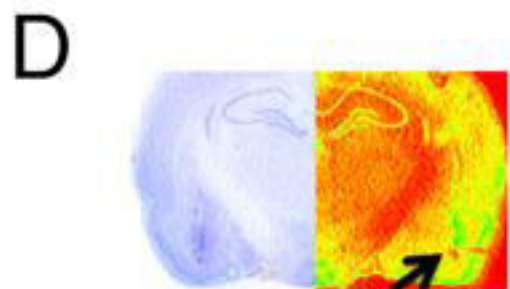
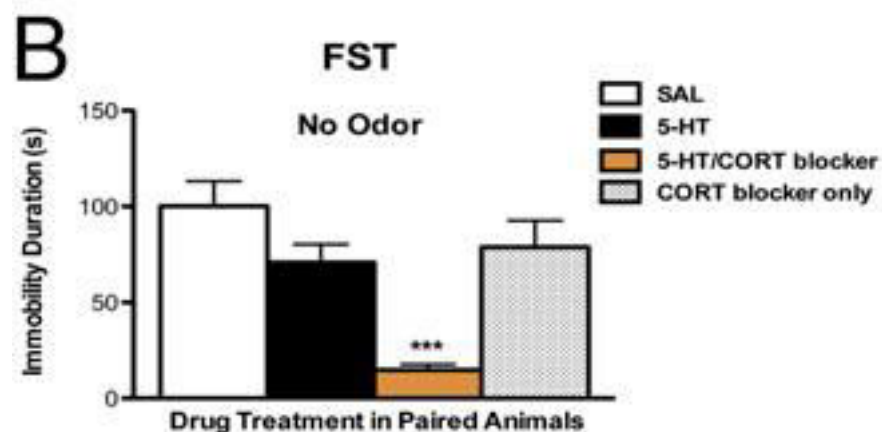
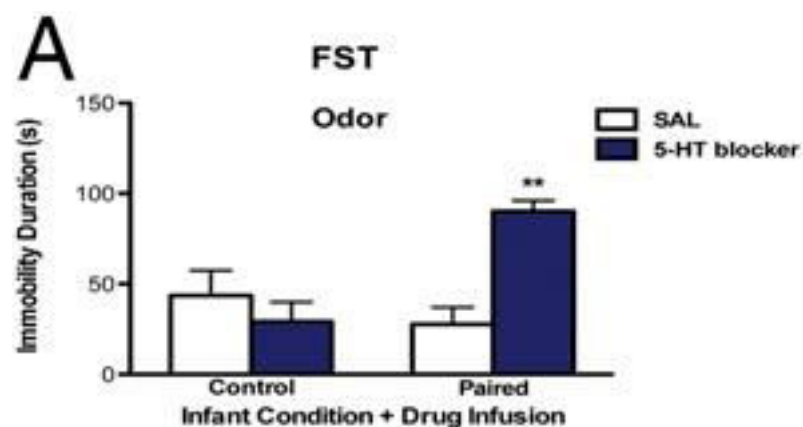


- **Limbic system**
- **Emotional memories**
- **Fear**
- **Salience**
- **Pleasure**

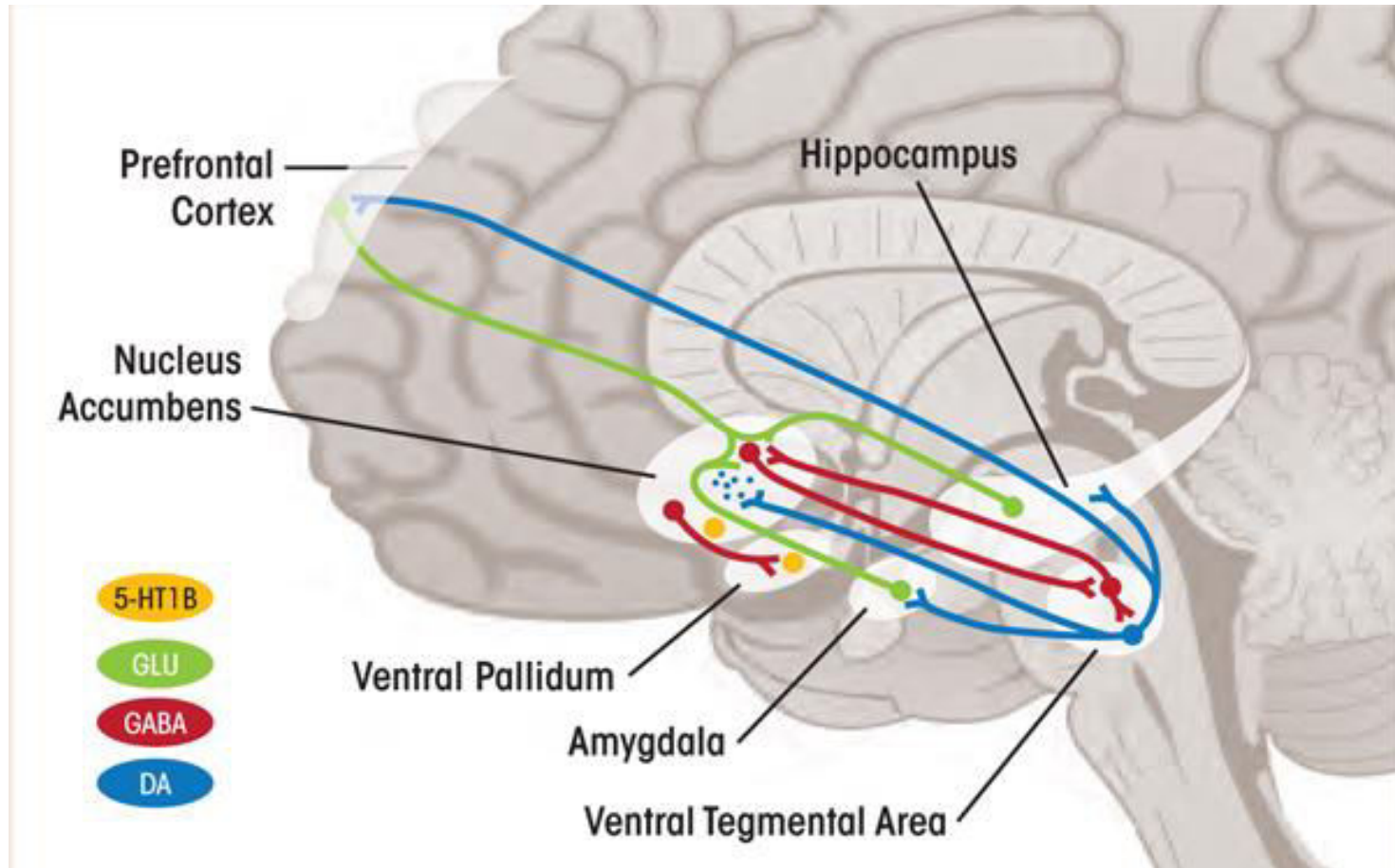
# Indiscriminate Amygdala Response to Mothers and Strangers After Early Maternal Deprivation



# Good Memories of Infant Trauma



# Neurobiology of Reward... and Attachment



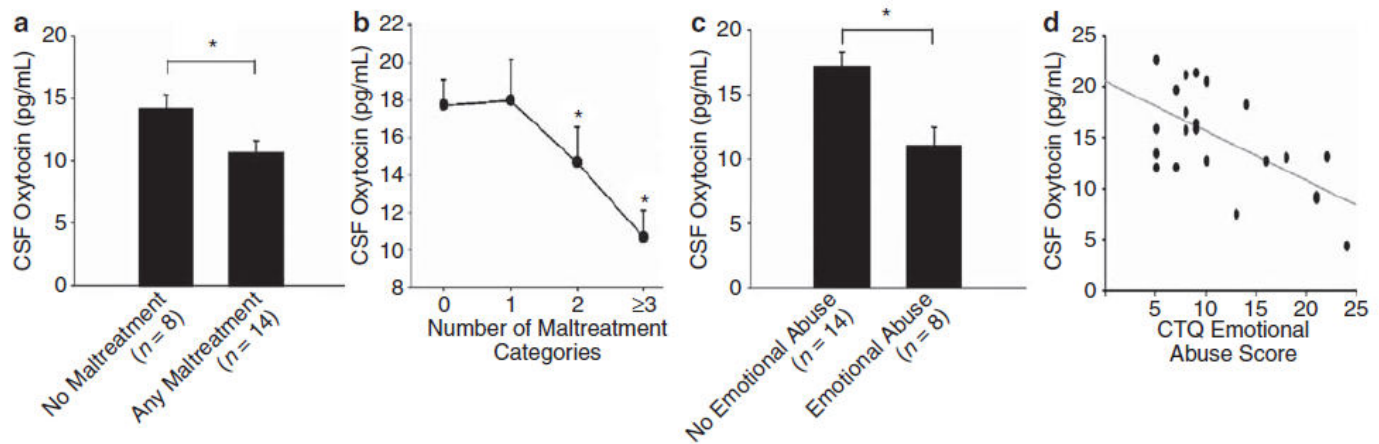
OXYTOCIN

# Oxytocin levels are lower in abused women

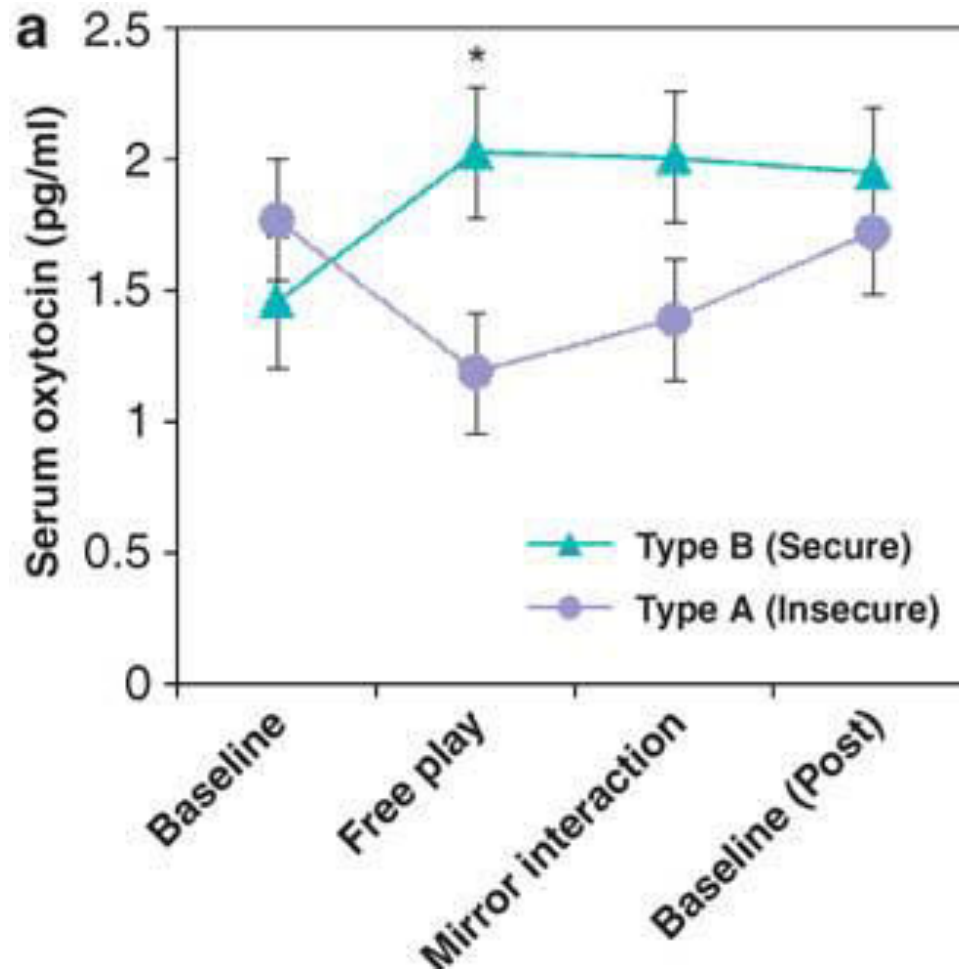


Lower CSF oxytocin concentrations in abused women  
C Heim *et al*

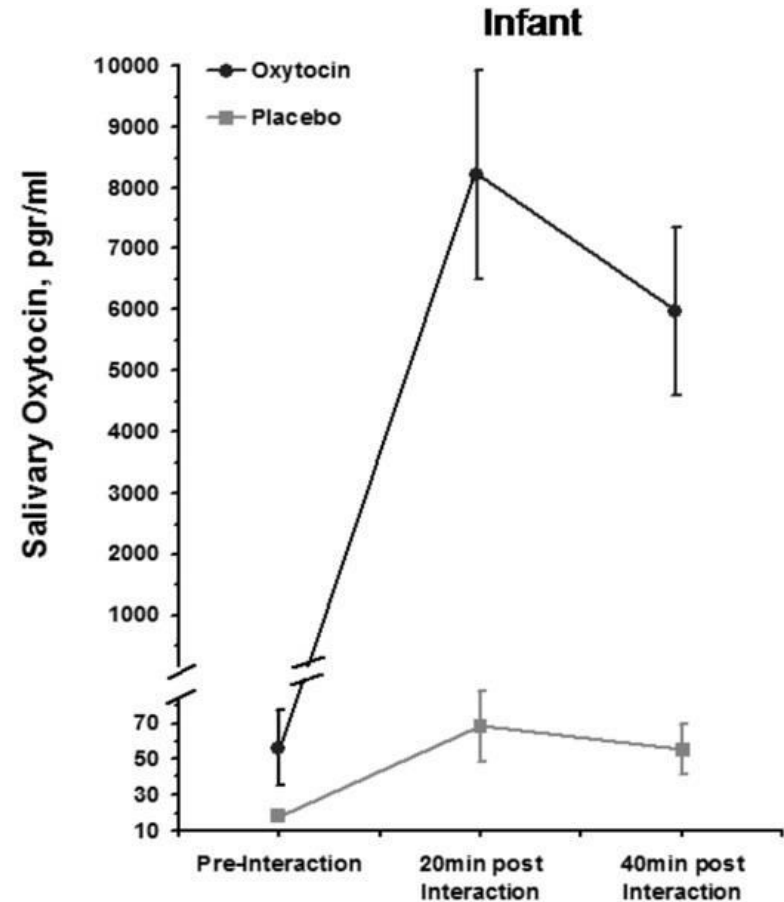
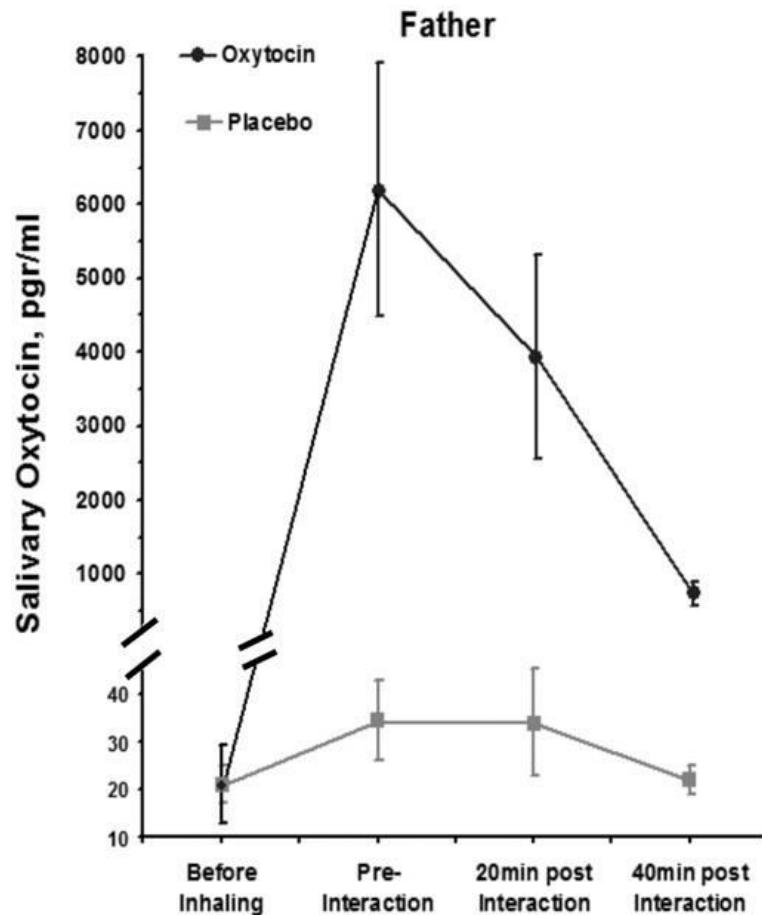
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# Attachment: Oxytocin



# Oxytocin levels correlate between parent and infant.

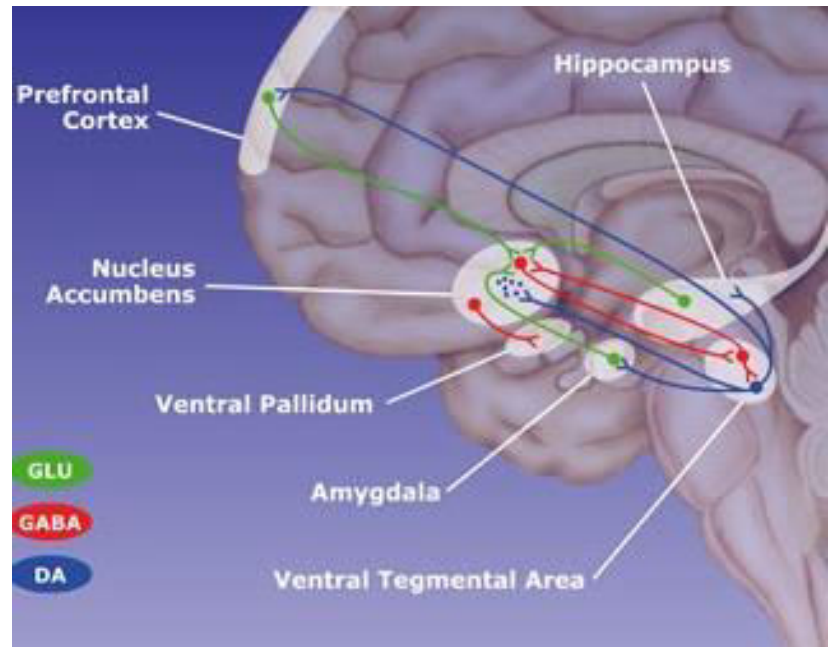
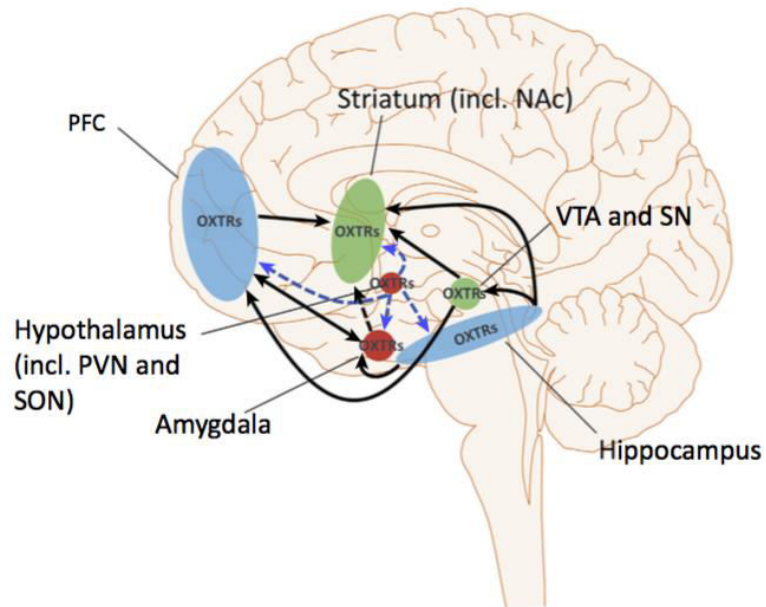


# Oxytocin

- Oxytocin administration to adolescent rats:
  - Decreased anxiety
  - Increased sociability
  - Higher oxytocin plasma levels
  - Decreased EtOH consumption

...In adulthood

# Oxytocin receptors: Connection to addictions



Bowen, MT and Neumann, ID. 2017. Trends in Neuroscience. 40 (12): 691.

# Neonatal Abstinence Syndrome

# Neonatal Abstinence Syndrome

<u>Nervous System</u>	<u>Respiratory System</u>	<u>Gastrointestinal System</u>
Tremors Fever Irritability High pitched crying Sleep disturbance Increased muscle tone Myoclonic jerks Seizures	Upper respiratory symptoms Difficulty breathing	Projectile vomiting Regurgitation Loose stools Poor feeding Excessive sucking Excessive weight loss

# The Neurobiology of the Infant with NAS

High stress- high cortisol

Oxytocin- ?

**\*Chronic opioid use decreases oxytocin...**

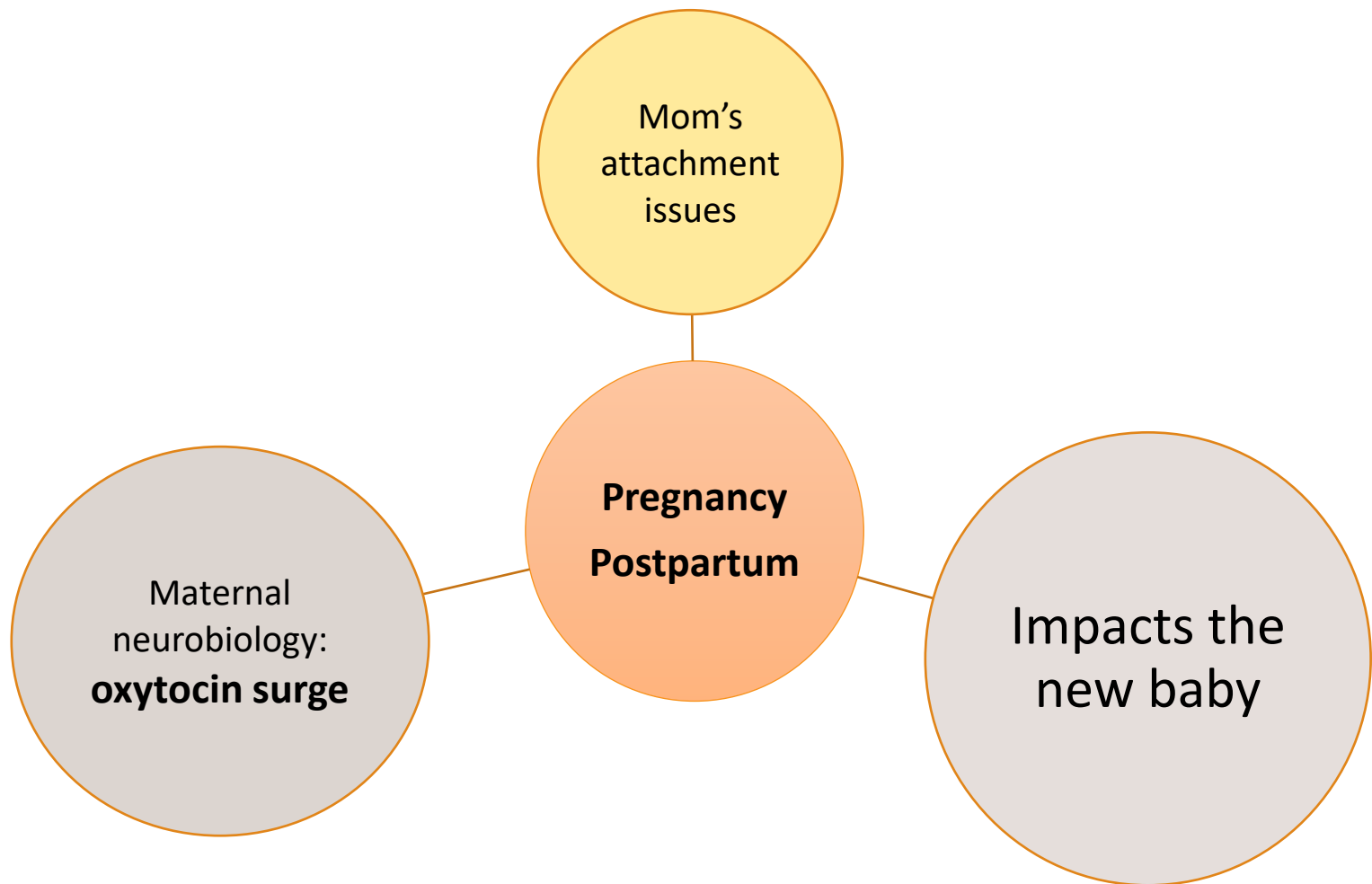
# Treatment

# Treatment of NAS

- What soothes baby: **Attachment**
  - Skin-to-skin contact
  - Breastfeeding
  - Contact with parents
  - Rooming-In

**\*Decreases Length of Stay and Morphine use by 50%!**

# When to intervene: **Motherhood**



# The Neurobiology of mother with opioid use

- Normal pregnancy and postpartum period:
  - oxytocin increase
- In opioid use:
  - ACE history and insecure attachment
  - Oxytocin response to infant postpartum-???

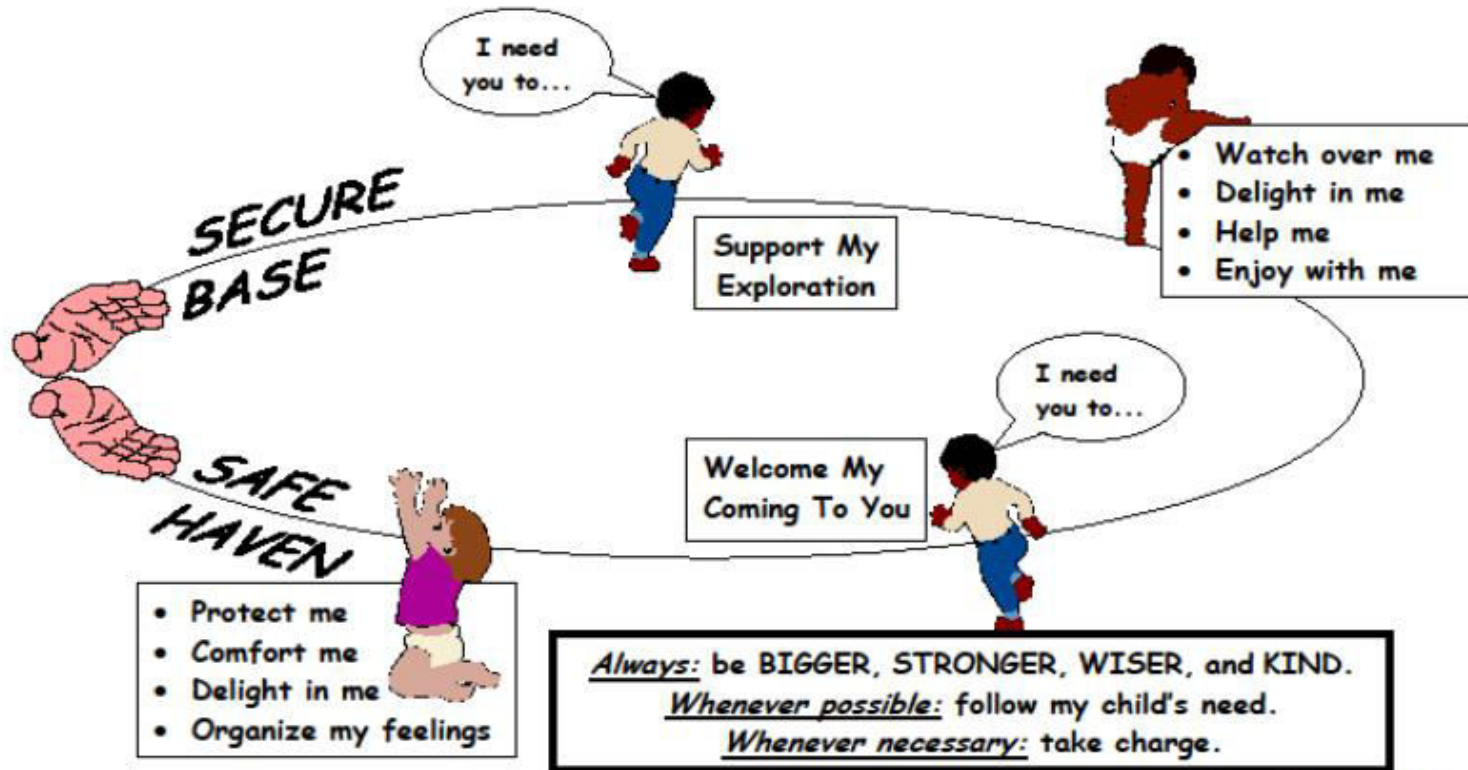
# ***Integrate treatment of mother and baby:*** **Enhance Mother-Infant Attachment**



- Enhance attachment of mother to therapist
- Enhance neurodevelopment of infant
- Redirect reward system toward attachment (rather than drug)

# CIRCLE OF SECURITY

PARENT ATTENDING TO THE CHILD'S NEEDS



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Thank you!

Questions???