The Mother-Baby Dance: The Right Brain Connection

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Sheba Medical Center

Right brained thinking—how mothers and babies think, and why this matters
Understanding how mother’s intuitive responses help their infants regulate state, mood and affect

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Declaration and Disclosure
I have an affiliation with one or more persons or entities that could be perceived as having a bearing on my presentation of this subject.

Affiliation Name of Organizations
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Objectives

The participant will:

1. List five ways the hormone oxytocin helps promote infant survival.
2. Explain how a mother’s innate intuitive right-brained interactions with her infant help her baby organize for learning, handle emotional stress, and adapt to his changing environment.
3. Explain how an understanding of right-brained processes can help healthcare providers better communicate with postpartum mothers.

THREE take-home messages

1. Oxytocin has simultaneous affects on mother and baby which aid their mutual communication.
2. A mother’s instinctive maternal interactions with her infant help her infant adapt to his environment, with both short-term and long-term consequences.
3. Oxytocin and other neurophysiologic factors affect the way the postpartum mother processes information. This has important implications for how the health care provider communicates with mothers.

This lecture’s structure

• A brief nod to the previous lecture, and then we take a little look at how oxytocin affects mothers.
• Half-way thru we’ll take a very superficial look at neuroanatomy, specifically, the different roles of the left and right brains, with attention to the amygdala and hypothalamus.
• From there, we get slightly deeper into how the mother’s intuitive interactions with her baby allow her right brain to connect with her baby’s right brain, and why that matters.
Infant “self-attachment”

Observations in the literature

“Self-attachment” on the first day of life
- Righard & Alade, 1990, the Lancet

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“Laid back breastfeeding”

Mother semi-reclined Baby in full body contact

Baby’s instinctive behaviors bring out mother’s instinctive behavior

Instructions get in the way of mother’s natural instincts


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“Liberated Motor Activity”

Claudine Amiel-Tison and Albert Grenier

- Touch and stroke infant
- Neck support eliminates reflex response to uncontrolled movements
- Talk to infant, eye contact
- “Communicative state” - Infant appears “charmed”


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The baby uses her cheeks to search

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Learning to breastfeed:
What’s going on?
How does this work?

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The key to seeing infant competence

What any mother knows
– Observe the baby in interaction with another
– Calm infant, alert, communicative state

Donald Winnicott:
“There is no such thing as a baby, there is a baby and someone.”

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Many more pieces to the puzzle
The work from the Karolinska Institute

Kerstin Uvnäs-Moberg, MD, PhD,
Ann-Marie Widström, et al

Oxytocin and other hormones
multiple effects on
- Mothers
- Babies
- Maternal-infant interactions
- Short-term, long-term consequences for both mother and baby
From neurochemistry to behavior to personality

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Oxytocin
Very ancient mammalian nonapeptide
Differs from vasopressin by two amino acids
Acts as BOTH
- A neurotransmitter
- A peripheral hormone

Cysteine — Tyrosine — Isoleucine

Cysteine — Asparagine — Glutamine

Proline — Leucine — Glycine

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Oxytocin
NOT just “love, labor & lactation”
(orasm, uterine contractions & milk ejection)
ALSO
- A wide variety of
  physiologic and behavioral responses
- All promote lactation and infant survival

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Oxytocin

Mother has it
- Nipple stimulation, skin to skin, and other neurosensory cues

Baby does too
- Suckling, skin to skin, and other neurosensory cues

Everyone has it, male or female
- Get it from warmth, touch, and other neurosensory cues

Oxytocin

Promotes infant survival
- Uterine contractions
- Milk ejection
- Gastrointestinal effects
- Cardiovascular effects
- Affiliation, affection
- Anti-stress effects
- Maternal behaviors

Varied effects
Released
- Into the peripheral blood
- To the body
- Centrally
- Into brain

Has differing effects because
- At different sites
- Central or peripheral
- Different receptors respond to
- Basal levels, or
- Pulsatile release, or
- Peak levels, or?

Oxytocin

Oxytocin does not just cause
- Uterine contractions & milk ejection

Also causes
- A wide variety of physiologic and behavioral responses in BOTH mother AND BABY
  - Anti-stress: calms both
  - Releases digestive hormones: mobilize nutrients
  - Increases blood circulation to breast
  - Encourages interaction and bonding
Oxytocin: The “affective” hormone

Everyone has it, male or female

- Get it from warmth, touch, neurosensory cues
- Affection, relationship, feeding
- Affiliation
- And hence infant survival

Food, sociability, eating, and affiliation

- Oxytocin: the socio-gastrointestinal link between eating and affiliation?

Oxytocin’s effects on maternal behaviors

Under the influence of oxytocin, the mother:

- Seeks more time with infant
- More breastfeeding
- Increased stroking, calming
- Increased tolerance of monotony

These effects are aided by oxytocin’s anti-stress and cardiovascular effects

Maternal “instincts”

Oxytocin’s effect on maternal behavior

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**Infant's oxytocin**

Stimulated by suckling, palate, oral mucosa

Touch, skin to skin, warmth

Promotes

- Digestion
- Choecystokinin ("CCK")—satiation
- Suckling—Calming
- Bonding

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**Oxytocin's simultaneous effects**

*On both mother and infant*

- Promotes affiliation, bonding
- Synchrony of state and mood
- Maternal calm helps baby calm

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**Right brains and left brains**

The right brain and the left—basic definitions and examples

Examples of right and left brained thinking:

- Mothers
- Infants
- Health care providers
<table>
<thead>
<tr>
<th>Left Brain</th>
<th>Right Brain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical</td>
<td>Intuitive</td>
</tr>
<tr>
<td>Sequential</td>
<td>Holistic</td>
</tr>
<tr>
<td>Rational</td>
<td>eMOTIONAL Synthesizing</td>
</tr>
<tr>
<td>Analytical</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>Subjective</td>
</tr>
<tr>
<td>Looks at parts</td>
<td>Looks at wholes</td>
</tr>
<tr>
<td>Verbal language</td>
<td>Body language</td>
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Communication

<table>
<thead>
<tr>
<th>Left brain</th>
<th>Right brain</th>
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<tbody>
<tr>
<td>Uses verbal language</td>
<td>Connects nonverbally</td>
</tr>
<tr>
<td>Gives specific instructions</td>
<td>Shows, demonstrates</td>
</tr>
<tr>
<td>Follows directions</td>
<td>Learns by feeling, doing</td>
</tr>
<tr>
<td>Decides on logic, analysis</td>
<td>Decides on &quot;gut&quot; feelings</td>
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The corpus callosum

Left and right communicate
Don't really work alone

Images in the public domain; from 1918 Gray's Anatomy
Corpus Callosum

In adults
- Left and right brains always work together
- One might be more dominant
  - At different times
  - In different circumstances
- Simultaneously use verbal and nonverbal language
- Understand both words and nuance
- Can be both creative and analytical

Differences

Physicians & health care providers
- Scientific, evidence based
- “Art” of medicine more intuitive

Mothers
- Foggy, confused, post partum
- “Cognitive deficit” = Left brain deficit
- Oxytocin effects
- Insecurity—sometimes wish for left brain “rules”
  Books, authorities provide those rules

Mothers?

Left Brain **a bit foggy**
  To compensate, she:
  - Watches the clock
  - Keeps a feeding log
    - In milliliters
    - And number of minutes
  - Does she understand “cross cradle hold”?
  - Writes down what you say

Right Brain **active**
  Loses track of time
  No clue when baby fed
  Last: eM OT ION AL
  “That makes sense”
  Remembers words associated with strong emotion
  Attends to body language
Infants
Almost no left brained activity until age 3 years
Right brain dominant

Mothers
Foggy post partum
LEFT BRAINED
“cognitive deficit”
Right brain dominance helps!
Mother-baby right-brain to right-brain communication

Communication
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The work of Allan Schore
Multidisciplinary model
– Neurosciences
– Behavioral pediatrics
– Psychology, psychiatry
– Attachment theory
Right brain to right brain communication
– The concept of “affective synchrony”
How mothers help their infants cope with stress
– How babies learn to handle stress

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Allan Schore
Concept of “affective synchrony”
Maternal infant interactions
(Innate intuitive behaviors)
– Eye to eye contact
– Vocalization
– Responsive interactions

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Allan Schore
Concept of “affective synchrony”

Neural right brain to right brain interactions via
- Hypothalamus
  (coordinates nerves & hormonal communication)
- Amygdala
  (emotions and memory)

That synchrony links activity
• in their limbic systems
• helps infant regulate emotions and behavior
Allan Schore

Through their “affective synchrony”
The infant’s immature and developing internal homeostatic systems are co-regulated by the caregiver’s more mature and differentiated nervous system.
• Helps infant organize for new learning
• Allows infant capacity to adapt to a rapidly changing environment
• Mediates infant’s stress-coping capacities

Allan Schore
Concept of “affective synchrony”
Just by her intuitive interaction with her baby, the mother co-regulates her baby’s nervous system.
• Mother’s nervous system is mature and well developed
• Baby’s is immature and still developing
So mother’s intuitive responses
• Help baby organize for new learning
• Allow baby to adapt to rapid changes around him
• Help the baby cope with stress
• Lay down brain pathways
A mother doesn’t have to know any of this stuff about the right brain—she does this all intuitively, because she loves her baby.

Allan Schore:
Concept of “affective synchrony”
Let’s watch this baby
Allan Schore

Affective synchrony not perfect
– Separation, breaks in synchrony
  • Helps infant learn distress can be resolved
– Lays down neural pathways for infants own coping capacities
  • First mother helps infant learn to cope with stress
  • Then the older infant learns to self soothe from these encounters
  • Allows infant to adapt to changing environment

Putting it all together

Schore’s model of maternal co-regulation of infant state
– Fits with Amiel-Tison and Grenier’s liberated neck
– Fits with role of oxytocin + vagal actions
– Basics of attachment

The mother-baby dance: Maternal infant interaction

The mother-baby dance: Maternal infant interaction
Single biological system—
  Two people, interacting
  Direct right-brain to right-brain connection
State regulation very immature at birth
  – Baby needs mother to help regulate state
Putting it all together

The maternal right brain
  – Dominant so she can communicate with baby
  – Emotions and learning
  – Emotions and memory

Basics of right-brained communication
  – Between mothers and babies
  – Between mothers and health care providers

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Implications for health care providers

Attend to mother’s state, baby’s state
  – Watch emotional content
  – Model positive interactions
  – Model responsive interactions
  – Support mother as model for her response to infant
Implications for health care providers

Take care with left brained instructions
   – Some mothers may need them
   – Reinforce with touch, tone of voice, modeling
   – Beware of that “cognitive deficit”
     • Explain in “intuitive” ways
     • Careful written instructions to reinforce any verbal
       instructions
     • Beware of how you may be misunderstood
   – Allow room for intuitive adjustment to plan

Facilitate right-brained “affective synchrony”
   – Use touch, tone of voice, body language
Model patience and calm
   – Help mom feel calm, relaxed, competent
   – Help baby feel calm, relaxed, competent
Encourage mother’s interactions with infant
   – Demonstrate, model for mother
   – Talk to baby. Show pleasure in mother and baby
   – Reinforce, enjoy instinctive behaviors

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