From the Breast to the Baby: Anatomy and Physiology

Birth & Beyond California:

Breastfeeding Training & QI Project

Objectives

- List two hormones that impact lactation
- Identify two measurable differences in infants held skin-to-skin
- Demonstrate appropriate and safe position options for mother and infant for skin-to-skin contact

The Breast

- Nipple
- Areola
- Montgomery glands
  - Enlarge during pregnancy
  - May contribute to breastfeeding performance, early growth and onset of lactogenesis II

Internal Structure of the Breast

- Glandular tissue
  - Extends into axilla, upper/inner arm, up to collar bone
  - Clustered close to the nipple
- Alveoli
- Milk ducts
- Fatty tissue

Hormonal Control of Milk Synthesis
Endocrine System

Pregnancy

- Progesterone levels are high
- Milk secretion is inhibited
- Milk volume “turned down”

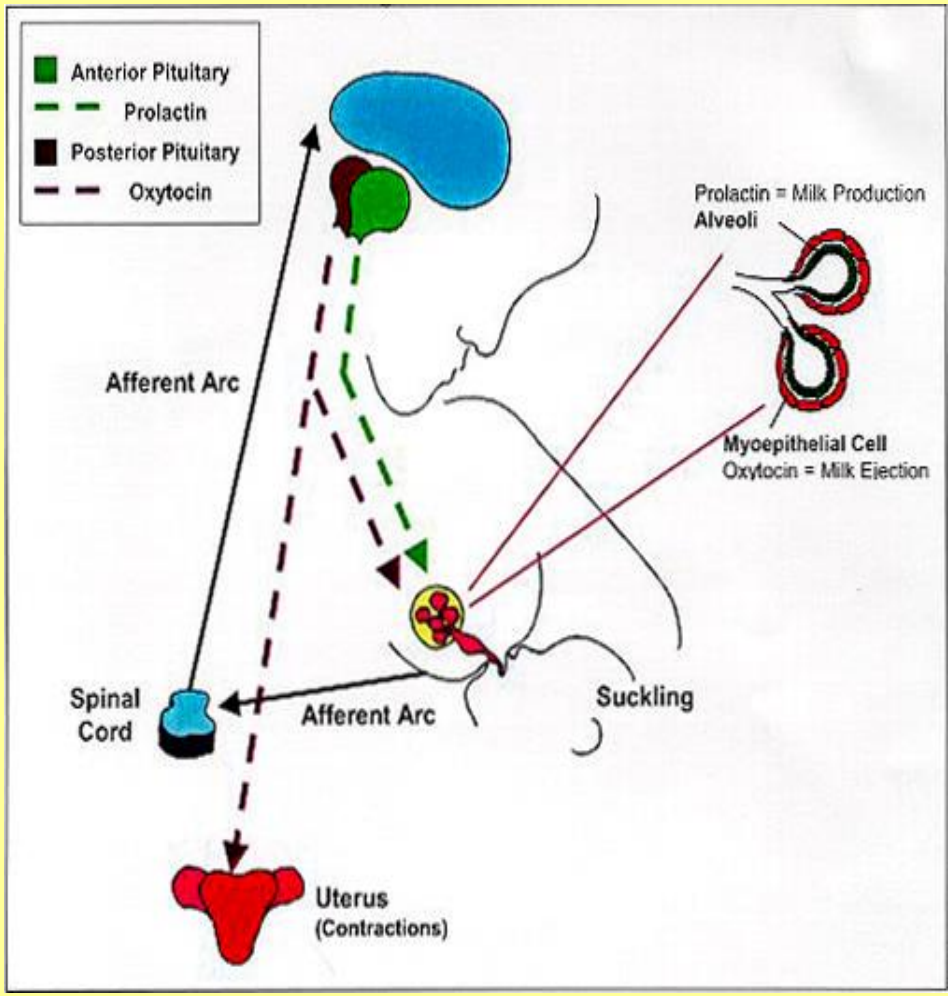
Delivery of Placenta

- Abrupt withdrawal of progesterone and estrogen
- High prolactin levels
- Copious milk production commences

Neville, *J Nutr*, 2001

The Milk Ejection Reflex
Let Down Reflex

- Nipple stimulation causes release of prolactin & oxytocin
- Prolactin is a milk making hormone
- Oxytocin is a milk releasing hormone
- Reflex conditioned over time



Synergy of Estrogen & Oxytocin

- Both hormones are present together in the mother for only a short time following birth
- Together they promote bonding and nesting behavior
- May be related to the optimal time to put mother and baby together

Uvnas-Moberg, *The Oxytocin Factor*, 2005

The Oxytocin Effect

- Relaxes and calms both mother and baby
- Increases bonding to partner and baby
- Sexual activity increases oxytocin
- Some call it the *love* hormone

Pitocin is NOT the Same as Oxytocin

- Pitocin does not cross the central nervous system barrier (blood brain barrier)
  - Is not sedative
  - Does not increase pain tolerance
  - Does not increase bonding
  - Does not cause mother's milk to flow
  - Contracts the uterus
- Oxytocin crosses the central nervous system barrier
  - Gut motility (increased digestive capacity)
  - Mood (sedative)
  - Pain (increased tolerance)
  - Blood pressure (decreased)
  - Contracts the uterus

Oxytocin and Lactation

- Stimulates milk ejection reflex
- Makes milk available to the baby
- Suckling, sight, smell and touch play an important role

Lawrence, *A Guide for the Medical Profession*, 2005

Baby Turns Oxytocin On
Baby Led System

Minutes:

6: Baby opens eyes
11: Massages breast
12: Hand to mouth
21: Rooting
25: Moistened hand to breast
Nipple becomes erect
27: Tongue stretches & licks nipple
80: Breastfeeding

Matthiesen, *Birth*, 2001

Supporting Baby's Latch

- Within 20 minutes of familiarization –
  65% of babies will self-latch
- Most babies will not latch
  until they are ready
- Forced babies
  - Push away
  - Clamp down
  - Refuse the breast
  - Shut down
- Do not push on the baby's head

Your Baby Knows How to Latch-on

Breastfeeding

- Physically, emotionally and hormonally mother and baby are connected
- Baby
  - Looks at mother's face
  - Plays with her clothing
- Mother
  - Engages, communicates, interacts

Establishing a Great Milk Supply

- Hormones begin the process
  - Progesterone and estrogen decrease
  - Prolactin and oxytocin increase
  - Copious milk production begins

Maintaining Milk Production Autocrine Control

- Breast emptying maintains the process
  - A full breast – decreased milk production
  - Prolactin cannot connect to receptors when breast is full
  - Fat content in milk decreased when breast is too full

Daly, *Exp Physiol*, 1993

FULL Breast	=	**SLOWER Milk Production**	**EMPTY Breast**	=	**FASTER Milk Production**

kellymom.com

Keep Mother and Baby Together

- Feed baby on cue, not on a schedule
- Interruptions disrupt the normal course of attachment and feeding
- Babies separated from mother cry more

Christensson, *Acta Paediatr*, 1995
Dabrowski, *AWHONN*, 2007

Recovery from Protest Despair

- Approximately 20 minutes to flush stress hormones from newborn's body
- Once recovered he will return to natural behaviors and rhythms
- Recovery following separation is essential to support breastfeeding

Skin-to-Skin = Protection

- Infant is naked on mother's naked chest, there is no bedding or clothing between them
- You will see a "new species of newborn"
  - More active
  - More awake
  - Less crying
  - More relaxed
  - Deeper sleep

Morelius, *Pediatrics*, 2005

Skin-to-Skin Dad

- 44 babies delivered by cesarean section placed skin-to-skin with father
- When compared to cesarean section babies placed in an incubator or cot
  - Blood glucose increased
  - Baby's temperature increased

Christensson, *Acta Paediatr*, 1996

Shared Skin-to-Skin for Multiples

- Simultaneous skin-to-skin
- Each breast responds to individual baby
- Improves attachment
- Relieves mother's fears about bonding with multiples

Swinth, *MCN*, 2000

Ludington-Hoe, *JOGNN*, 2006

Skin-to-Skin Safety Considerations

Mother and Baby

- Baby is stable
- Mother is awake
- Responsible person available to help mother as appropriate

Environment

- Bed lowered
- Call button within reach
- Side rails up on bed (check hospital policy)

Monson, *Pediatrics*, 2008

Skin-to-Skin Activity

- Demonstrate skin-to-skin placement
- Demonstrate assessment while baby is skin-to-skin
- Return demonstration

When Baby is Not Skin-to-Skin

- Safe swaddling/wrapping/dressing of newborns
  - If baby's trunk is warm – fewer clothes/blankets
  - If baby's trunk is cool – add another layer
- Appropriate for the environment/season
- No mittens – babies need their hands

Bystrova, *Early Human Development*, 2007

Van Sleuwen, *Pediatrics*, 2007

Amazing Talents of the Newborn: The First Hour

Video:

By Marshall Klaus, MD

Measurable Differences in Babies held Skin-to-Skin:

- Stabilizes the infant's oxygen
- Keeps baby WARM or COOL depending on their needs
- Stabilizes their blood pressure
- Reduces crying
- Increases quiet alert state which leads to mother/infant interaction

Moore, *Cochrane Database Syst Rev*, 2007

Skin-to-Skin Contact is Analgesic

- Skin-to-skin is a remarkably potent intervention against pain experienced during a heel stick in newborns
- Infant is skin-to-skin 15 minutes prior to stick

Gray, *Pediatrics*, 2000

Castral, *Eur J Pain*, 2008

Skin-to-Skin: Good For Mother

- Decreases uterine bleeding
- Stimulates hormone release for milk production
- May lessen maternal depression

Akman, *J Paediatr Child Health*, 2008

Sobhy, *J Egypt Public Health Assoc*, 2004

Matthiesen, *Birth*, 2001

Dombrowski, *MCN*, 2001

AAP Guideline

Healthy infants should be placed & remain in direct skin-to-skin contact with their mothers immediately after delivery until the first feeding is accomplished.

AAP, Breastfeeding and the Use of Human Milk, 2005

Conclusion

- The baby and mother are physiologically interdependent
- The mother provides the “habitat”
- The nurses model and teach fathers and families to protect the dyad and keep them together

Photo Credits

- Slide 1 – Macierzynstwo by Stanislaw Wysplanski circa 1905
- Slide 10 – courtesy Ellen Steinberg

TAKE HOME MESSAGE

- Please complete the “Take Home Message”
- Answer the three questions
- Address with your home mailing address