

# The First 48 Hours of Life

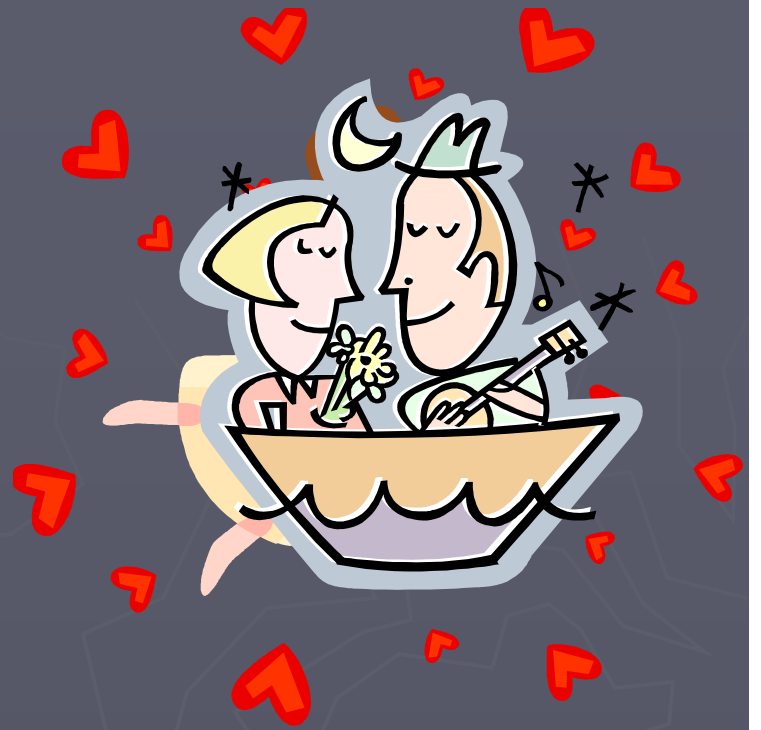
## Hormones After Birth



Ellen Chetwynd RN BSN IBCLC  
University of North Carolina  
Department of Family Medicine

# Objectives

- > Review biological chemicals that play a role in birth, post partum bonding, and parenting
- > Explore the behaviors of newborn mothers, fathers, and babies immediately post-partum
- > Analyze which hospital policies are helpful, or harmful to this human, biological progression



# Oxytocin

The Love Hormone

# Roles of Oxytocin: Physical

- > Increases length and strength of contractions in labor, milk ejection reflex, and orgasm
- > Released with physical contact, especially skin to skin
- > Increases nutrient absorption in both mother and baby
- > Infants release oxytocin during nursing, and to a lesser extent, during bottle feeding

# Roles of Oxytocin: Emotional

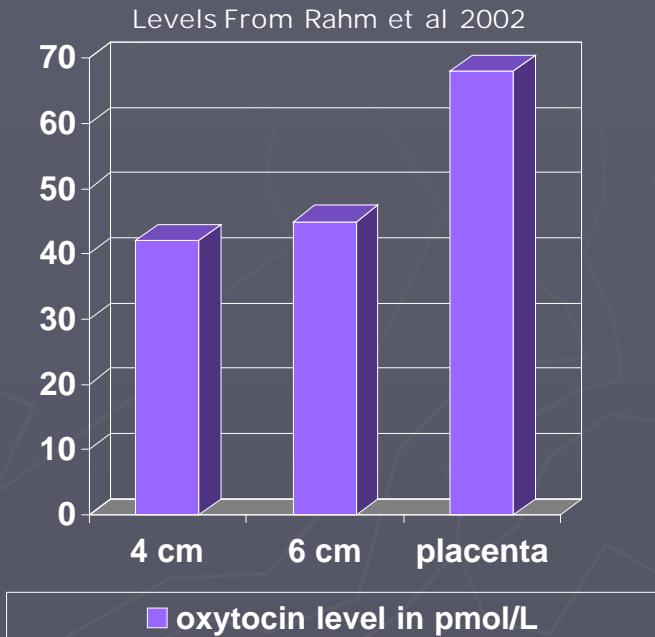
- > Promotes desire for further contact with individuals who cause its release-BONDING (Febo et al 2005)
- > Increases grooming behaviors directed towards the infant after birth (towards self before birth)
- > More oxytocin secreted in women who are in a committed relationship
- > Interactions involving trust increase oxytocin levels in men and women (Zak et al 2004)

# Roles of Oxytocin: Emotional

- > For infants, being attended to and held produces oxytocin
- > Live in fathers have elevated oxytocin levels at the end of their partner's pregnancy
- > With increased infant contact, oxytocin release encourages father's to become more involved in ongoing care of infant
- > Oxytocin increases father's desire for physical (not necessarily sexual) contact with his partner

# Oxytocin levels

- > Immediately prior to onset of labor, oxytocin receptors multiply in the myometrium (Husslein 1984)
- > Oxytocin is produced in the pituitary and circulates in the plasma and the brain (Keverne and Kendrick 1994)
- > Plasma concentrations increase in the second stage of labor, peak with delivery of placenta, and stay elevated for about an hour. (Rahm et al 2002, Nissen et al 1995)



# The Beauty of Oxytocin

The background of the slide is a dark blue-grey color. It features a faint, light-colored graphic on the left side. This graphic includes a compass rose with a needle pointing towards the top-left, and a topographic map with various contour lines and a grid. The text 'The Beauty of Oxytocin' is centered in the upper half of the slide in a light yellow, serif font with a subtle drop shadow.





# Prolactin

The Parenting Hormone

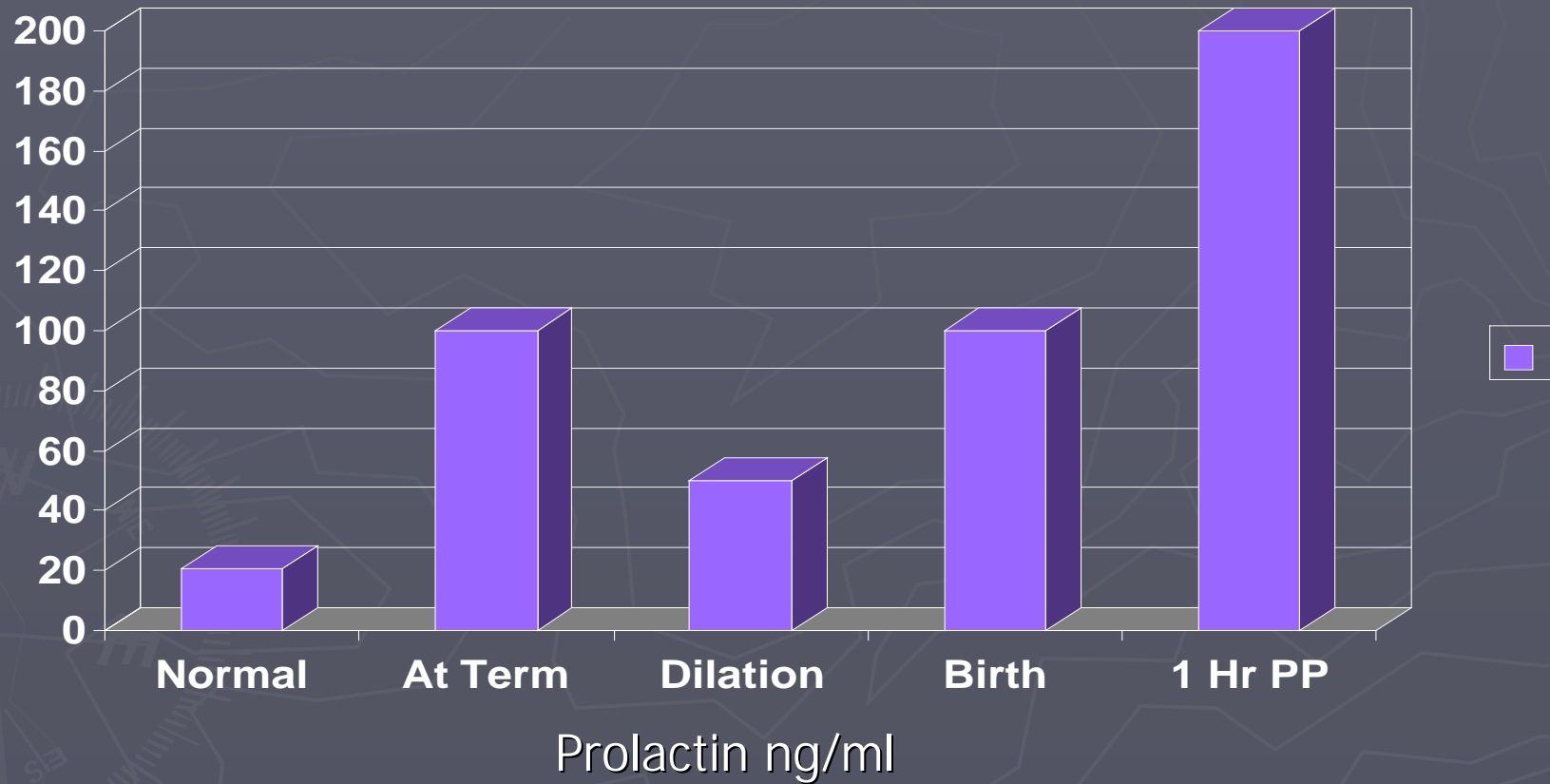
# Roles of Prolactin: Physical

- > Promotes milk production
- > Causes relaxation and fatigue in mother during nursing
- > Stress hormone
- > Begins to elevate in cohabitating fathers during mother's pregnancy
- > Decreases testosterone levels in males and females which decreases libido

# Roles of Prolactin: Emotional

- > In parents, it serves to increase parenting
  - Promotes caregiving behaviors and directs reorganization of the brain to favor caregiving behaviors
  - Causes submissive behaviors (in primates) allowing parents to put their children first
  - Fathers release prolactin in response to intruders, childless males do not.

# Prolactin Levels



Fernandes PA, Stanley KR, Wodzicki AM, Allardice JG, McCoshen, JA 1997

# The Beauty of Prolactin



# Endorphins

"I feel good!"



# Role of Beta Endorphins: Physical

> Secreted with:

- Stress, duress and pain
- Sex
- Pregnancy
- Birth
- Breastfeeding-peak 20 minutes after latch (Franceschini et al 1989)
- Physical activities

> We can become habituated to its presence (Kimball 1979)

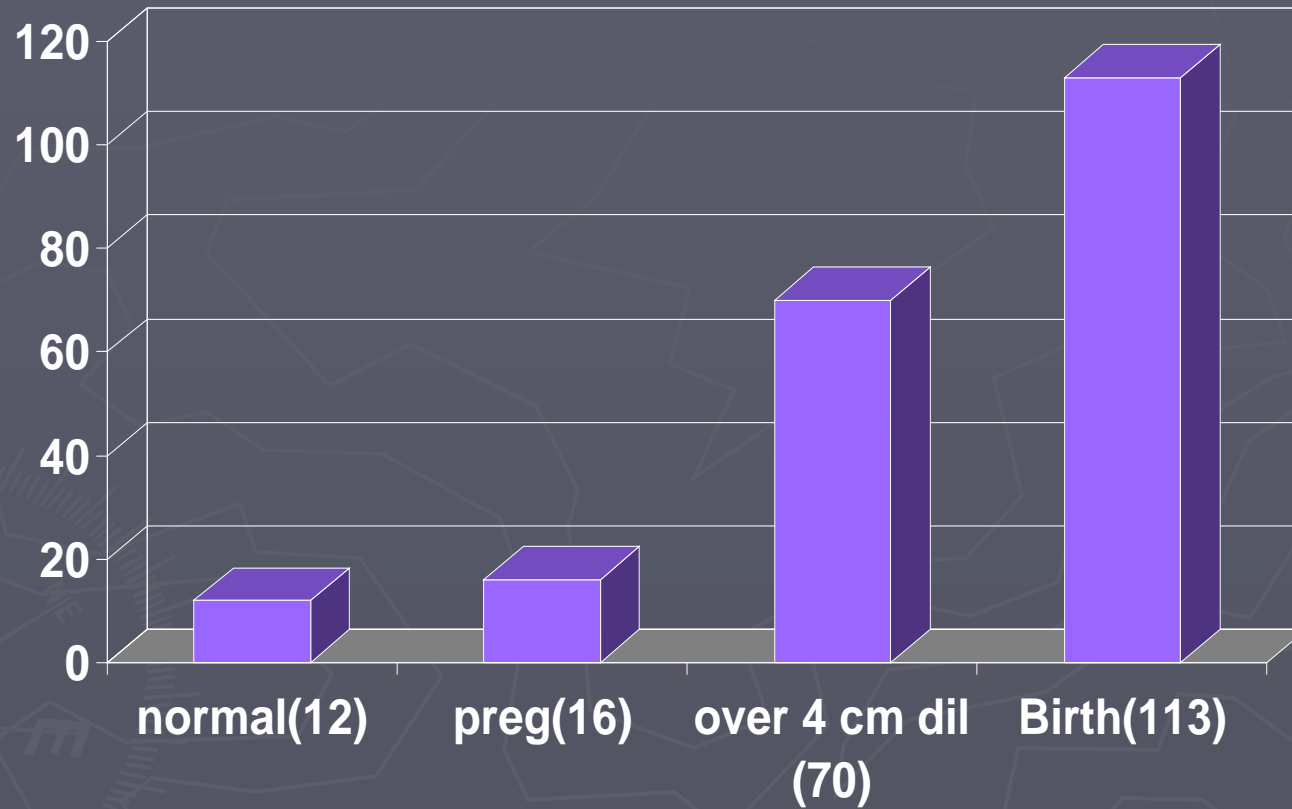
> Oxytocin inhibits our habituation to beta endorphins

# Role of Beta Endorphins: Emotional

- > Secreted during social contact, particularly touch between parent and child (for both)
- > Face of loved one can cause a surge.
- > Induces feelings of
  - Pleasure
  - Euphoria
  - Altered state of consciousness
  - Reduced perception of pain
- > Helps reward parents and infants for interacting (Kimball 1979)
- > Prolonged separation in well attached parents and children can be physically uncomfortable as their levels of endorphin drops



# Beta Endorphin Levels



Beta Endorphin Levels (pg/ml)

Goland RS, Wardlaw SL, Stark RI, Frantz AG 1981

# The Beauty of Beta Endorphins



# Looking at Newborns, Their Parents, and Hospital Procedures



# Skin to Skin Contact Improves Parenting Relationships

- > Newborns warmer when held on mother than in cot  
(Christensson et al 1992)
- > Oxytocin causes localized vasodilation in the breast which elevates the skin temperature  
(Lind et al 1971)
- > Blood glucose higher when held on mother than in cot  
(Christensson et al 1992)
- > Crying virtually absent skin to skin v short pulses of crying in cot  
(Christensson et al 1992)

Of note is that in all of these studies, the separation group was norm, and study groups had increased contact

# For a Long Time!

- > More affectionate behaviors with increased skin to skin contact during breastfeeding day 2. Effect more pronounced with less social support and less marked in baby girls (Anisfeld et al 1983)
- > Less restlessness and crying at 12 weeks (Ali et al 1981)
- > Improved mother/child interaction and better urine continence during the day at 3 years old (Wiberg et al 1989)
- > Fathers who hold their babies in the first hour, spend more time parenting their babies after discharge

# Oxytocin and Post Partum Adjustment

- > Oxytocin decreases stress hormones in both mother and baby (Christensson et al 1992)
- > Oxytocin in the first few weeks post partum increases tolerance of monotony, and makes women less anxious and less aggressive (Uvnas Moberg et al 1990)
- > Brain restructuring from oxytocin levels at birth facilitate oxytocin release during breastfeeding (Modney et al 1994)

# Nursing in the First Hour Increases Breastfeeding Success

- > Infants can find the breast and latch on in the first hour by using smell of amniotic fluid and similar smell of Montgomery glands (Verendi et al 1994)
- > Oxytocin released during labor increases olfactory learning (Varendi et al 2002, Febo et al 2005)

# Nursing in the First Hour Increases Breastfeeding Success

- > Sucking, licking, and touching the nipple increases the efficiency of nutrient absorption in mother and baby's gut. (Widstrom et al 1990).
- > Unmedicated infants push and stroke the breast prior to first latch which increases effectiveness of oxytocin release in mother (Matthiesen et al 2001)



# Just early contact alone increases breastfeeding success

- > Multiple studies show that early contact increases breastfeeding rates at 2-3 months (Sosa et al 1976, de Chateau & Wiberg 1977, Thomson et al 1979, Ali & Lowry 1981)
- > Mothers are less likely to breastfeed exclusively in the hospital if the first feed is delayed to 7-12 hours (Kurinj & Shiono 1991)
- > Early skin to skin contact has more effect than early breastfeeding on duration of exclusive breastfeeding (Vaidya et al 2005)

# What do We Know Hormones do After Birth?

- > Prolactin at peak levels promotes parenting behaviors
- > Beta endorphins at peak levels after birth begin to reward and habituate bonding behaviors in mother and baby.
- > Oxytocin at peak levels begin the bonding process and physically induce an emotional state in which bonding and parenting is most likely to occur.
- > Both prolactin and oxytocin after birth change the structure of the parents' brain forever.

# Effect of Planned Cesarean Section

- > Oxytocin levels do not rise to second stage labor levels
- > Endorphins are muted
- > Prolactin changes related to labor don't happen
- > Holding baby is delayed, as is first feeding

# What do we know about Effect of C/S?

- > Reduction in oxytocin pulsatility immediately post partum (KC Evans et al 2003, Marchini et al 1988, E Nissen et al 1996)
- > The umbilical cords of babies born by c/s have lower levels of oxytocin than women who labor (Sellars et al 1981)
- > Less prolactin released with early suckling (KC Evans et al 2003)
- > There is a multiphasic pattern to prolactin secretion in the first 24 hours which is absent with scheduled c/s (Rigg et al 1977)

# What do we know about Effect of C/S?

- > Lower breast milk transfer initially (KC Evans et al 2003)
- > Baby has slower return to birth weight (KC Evans et al 2003)
- > Mothers delivering via c/s score lower on LATCH scores with breastfeeding first 3 times (Cakmak 2006)
- > Decreased duration of breastfeeding (Henderson et al 2002)zxd

# Effect of Labor Pain Medications

- > Levels of prolactin and beta endorphins diminish with both epidurals and narcotics (Bacigalupo et al 1990)
- > Epidurals cause a decrease in oxytocin levels during labor and after birth (Rahm et al 2002, Goodfellow et al 1993)
- > Prolactin levels drop in unmedicated labor 2 hours before birth. They drop less with the use of narcotic (Onur et al 1989)

# Effect of Labor Pain Medications

- > Epidurals (varying with type of medication) cause decreased motor scores in infants persisting for 8 hours (Scanlon et al 1974) or 4 weeks (Sepkoski et al 1992)
- > Decreased duration of breastfeeding with narcotics and epidurals (Rajan 1994, Henderson et al 2003)
- > Fewer prefeeding behaviors such as massaging the breast (Matthiesen et al 2001)
- > Increased crying in the first hour (Ransjo-Arvidson et al 2001)
- > Narcotics decrease suckling behavior in the first 2 hours after birth (Righard & Alade 1990, Nissen et al 1995)

# Effect of Pitocin Use in Labor

We have no studies that tell us what happens to natural oxytocin levels in the brain, when exogenous Pitocin is used in labor or after delivery

However....

It is tempting to extrapolate that there may be a physiologic decrease in levels in the brain, if plasma levels are being supplied externally.



# Hospital Procedures

## NEGATIVE

- > Observation of newborns after birth
- > Newborn nurseries
- > Eye ointment within the first hour
- > Newborn exam in the first hour
- > Wrapping babies in blankets after birth
- > Continued interruption of mother and baby after birth

# Hospital Procedures

## POSITIVE

- > Labor support/doulas
- > Conservative use of pain medication and pitocin
- > Baby to mother's chest after birth
- > Facilitating skin to skin contact
- > Delayed newborn procedures
- > Rooming in
- > Limited visitation on Labor and Delivery
- > Lactation support

# The Back Up Plan

- > If a woman has no labor, she can still get oxytocin surges with breastfeeding
- > If unable to breastfeed, close nurturance during bottle feeding can still give oxytocin surges although to a lesser degree
- > If separated during the newborn period, parenting activities themselves release oxytocin and bonding can commence with parenting
- > Vulnerable families may be less able to compensate