

# Supporting Physiologic Birth in the Hospital



**EMILY HART HAYES, DNP, CNM, WHNP**  
**CELESTE THOMAS, MS, CNM**

# What is Physiologic Birth?



“A normal **physiologic labor and birth** are powered by the innate human capacity of the woman and fetus. The birth is more likely to be **safe and healthy** because no unnecessary interventions disrupt normal physiologic processes.<sup>1</sup> Some women and/or fetuses will develop complications that warrant medical attention to assure safe and healthy outcomes. However, there is good evidence that **supporting the normal physiologic processes of labor and birth**, even in the presence of such complications, has the potential to **enhance best outcomes** for the mother and infant.”<sup>2-4</sup>

# Fostering Physiologic Birth – Maternal Benefits



**Reduced peripartum morbidity** through avoidance of surgery and related complications<sup>5</sup>

Possible **reduction in chronic disease** through improved likelihood of breastfeeding<sup>6</sup>

**Improved birth experience** through access to supportive care and involvement in decision-making<sup>7</sup>

**Reduced costs** for maternity care primarily through reduced rate of cesarean birth<sup>8</sup>

# Fostering Physiologic Birth – Neonatal Benefits



**Reduction in iatrogenic harms** related to augmentation, induction of labor, instrumental vaginal birth, neonatal respiratory distress, and neonatal lacerations<sup>4,9-11</sup>

Possible **reduction chronic disease** related to cesarean delivery and disrupted or delayed breastfeeding<sup>12-13</sup>

**Improved maternal-infant attachment**<sup>14</sup>

# Fostering Physiologic Birth – Care Providers



Increased **professional satisfaction**

Improved **performance on quality measures**

Possible reduction in **adverse events and related liability** from reduced use of oxytocin<sup>15</sup>

# Characteristics of Physiologic Birth

- **Spontaneous** onset and progression of labor
- **Biologic & psychologic conditions** that promote effective labor
- Early **skin-to-skin** & keeping mother & infant together during postpartum

When we allow...

We see...

- **Vaginal birth** of infant and placenta
- Facilitates optimal **newborn transition**
- Supports early initiation of **breastfeeding**

# So, how do we measure up?



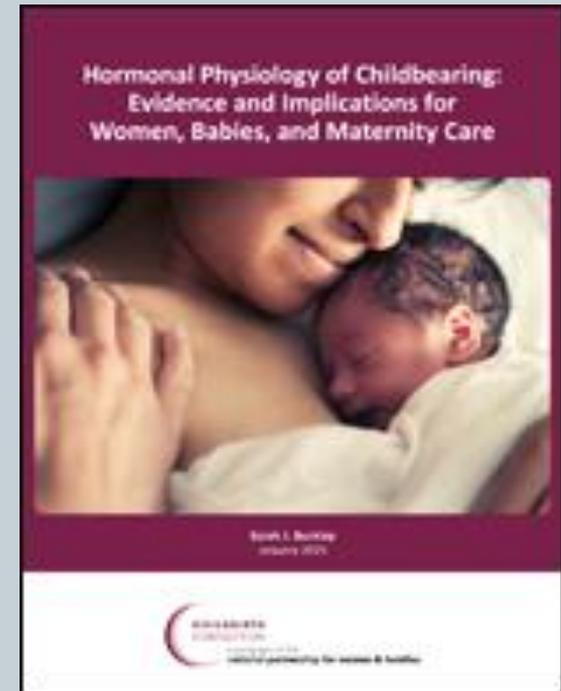
## Listening to Mothers III Survey 2013<sup>16</sup>

- More than 1/2 of pregnant women receive **synthetic oxytocin** to induce or augment labor
  - Requires additional interventions to monitor, prevent, or treat side effects
- Less than 1/2 **ambulate** during labor
  - Despite evidence that movement promotes labor progress and prevents labor dystocia
- More than 2/3 birth in the **supine position**
  - Despite evidence that this position increases the likelihood of instrumental vaginal delivery and episiotomy
- 1/3 birth via **cesarean section**
  - With potential for serious short and long term health consequences for the woman, her infant and future pregnancies

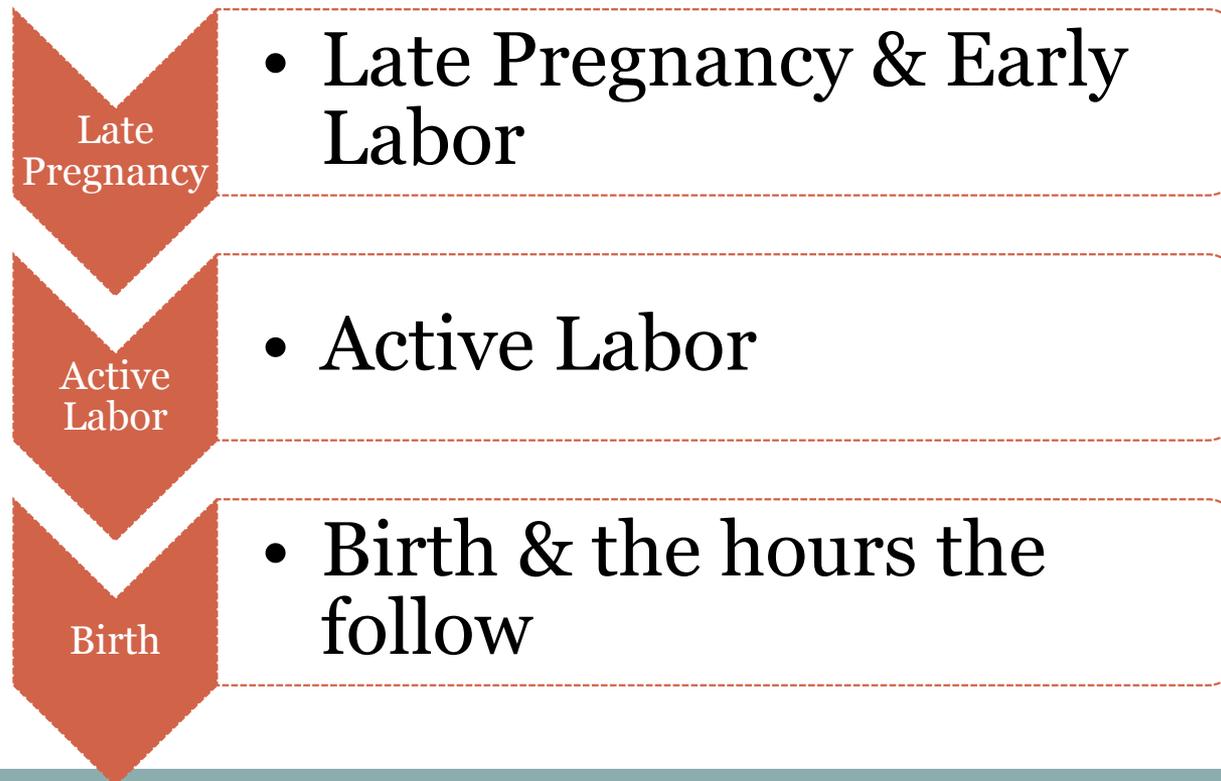


# Hormonal Physiology of Childbearing: Evidence & Implications for Women, Babies & Maternity Care (2015)<sup>17</sup>

- Produced by Childbirth Connection, authored by Dr. Sarah Buckley
- Synthesizes the extensive literature of hormonally-mediated processes of parturition and the early postpartum period



# The Hormonal Cascade of Childbearing



# The Hormonal Cascade of Childbearing



- Late Pregnancy and Early Labor
  - Rise in **hormone & receptor systems** prepares for:
    - ✦ Efficient labor and birth
    - ✦ Efficient lactation and bonding/attachment (in animal studies)
    - ✦ Fetal well-being in labor and newborn transition

# The Hormonal Cascade of Childbearing



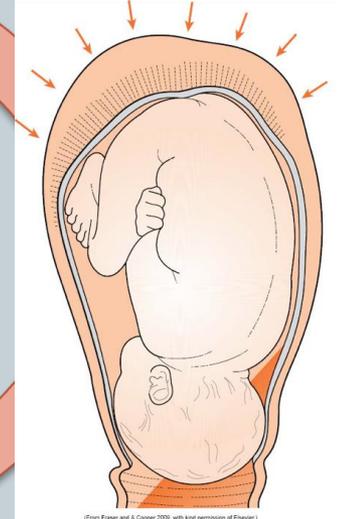
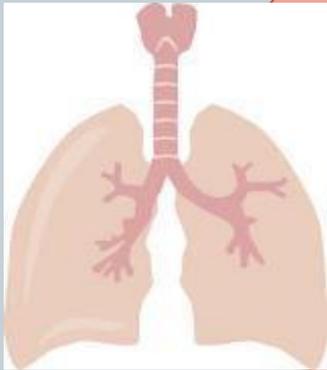
- Active Labor
  - **Hormonal processes** prepare for:
    - ✦ Effective postpartum contractions & **hemorrhage prevention**
    - ✦ Healthy **newborn transition**
    - ✦ **Breastfeeding & bonding** (based on animal studies)

# The Hormonal Cascade of Childbearing



- Birth and the hours that follow
  - **Physiologic birth** and skin-to-skin contact promote:
    - ✦ Hormone release that **may reduce hemorrhage risk**
    - ✦ Initiation of mother-newborn **bonding**
    - ✦ Preparation for successful **establishment of long-term breastfeeding**

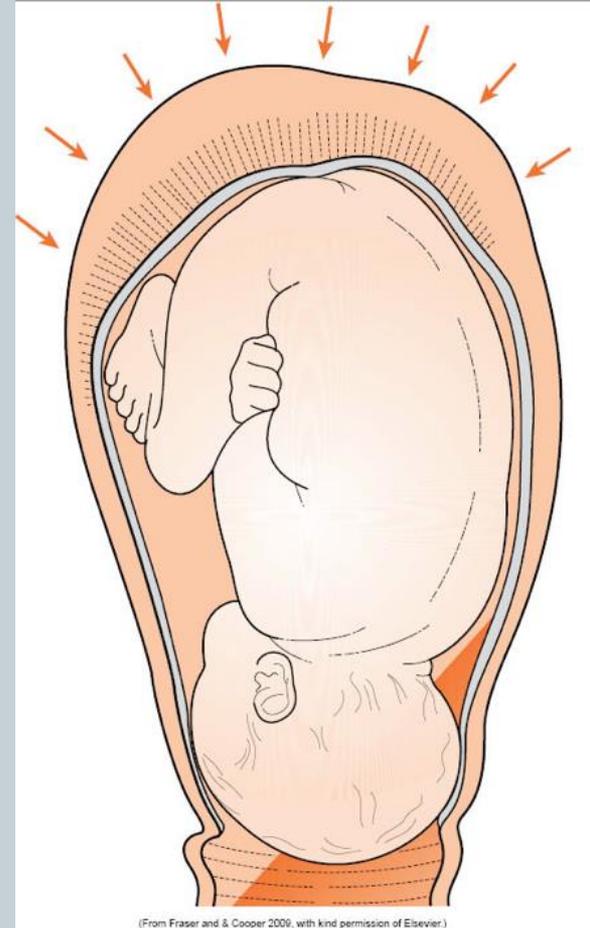
# Spontaneous Onset of Labor vs. Scheduled Birth



# Oxytocin & Prostaglandin



- Increases in oxytocin and prostaglandin receptors at the physiologic onset of labor **prime the uterus** to promote **effective contractions** in labor



(From Fraser and Cooper 2009, with kind permission of Elsevier.)

# Oxytocin, con't



- Elevations in mammary and central oxytocin and prolactin receptors prepare for **breastfeeding and maternal-infant biological bonding.**



# $\beta$ -endorphins



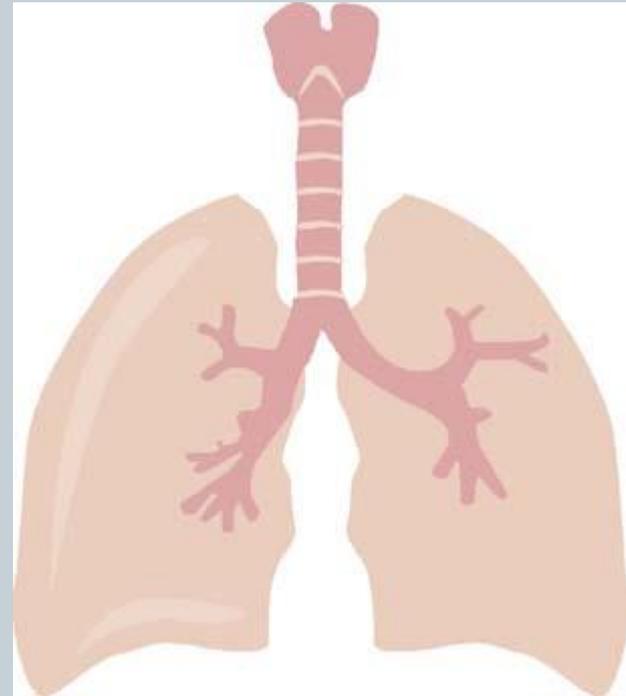
- Increases in brain-based (central) receptors for  $\beta$ -endorphins prepare **endogenous pain-relieving pathways** (based on animal studies)



# Cortisol



- Rising cortisol supports maturation of the **fetal lungs** and other organs.
- Pre-labor preparations in oxytocin and catecholamine systems promote **fetal protective processes** of labor and **optimal newborn transition.**



# Practices that support beneficial hormonal action when scheduled birth is necessary



- Induce labor or schedule cesarean **as close as is safely possible** to the physiologic onset of labor.
- Begin with **least invasive/lowest dose** interventions to minimize hormonal disruption.
- Maintain a **calm, low-stress environment in labor**, as high levels of stress may interfere with labor progress via several hormone pathways.
- **Promote skin-to-skin contact** between mother and baby immediately after birth to optimize maternal and newborn oxytocin levels, support breastfeeding success, enhance maternal-infant bonding behavior, and likely reduce postpartum hemorrhage risks.



## Precautionary Point

*“Developmental and epigenetic principles suggest that perinatal manipulations and exposures could have long-lasting programming effects. Animal research finds effects on offspring hormonal systems through to adulthood from newborn synthetic oxytocin administration. **While this research is still developing, a precautionary approach to exposure in essentially healthy women and babies is prudent.**”*

# Stress hormones during labor & birth



# Eustress (Just right)



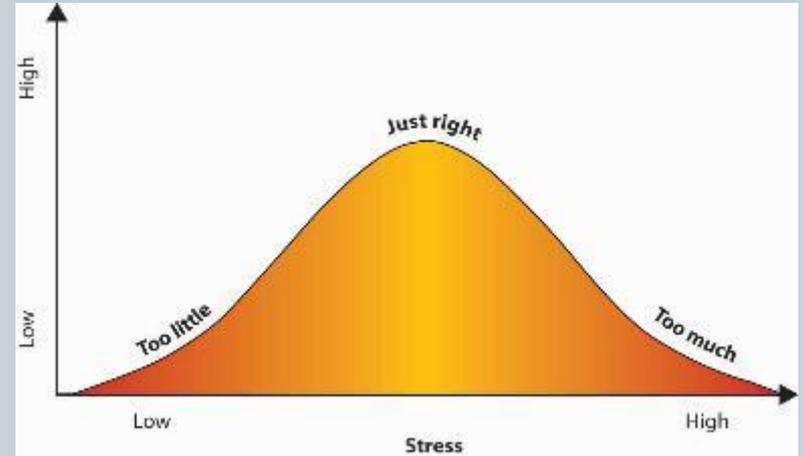
- Short-term maternal elevations in **epinephrine (E), norepinephrine (Nor-E), and cortisol** occur in response to labor stress and pain
- In the right amount (eustress), the mother remains alert and focused
- Short-term **fetal elevations in E and Nor-E**
  - Protects the fetus from hypoxia & promotes neonatal transitions
    - ✦ Optimizing breathing, temperature, and glucose regulation
    - ✦ Promote newborn alertness, benefitting bonding & breastfeeding initiation
- Following birth, **maternal and newborn stress and stress hormone levels drop quickly**
  - Supported by oxytocin and beta-endorphins resulting from maternal newborn skin-to-skin contact

# Excess Stress



- **Fight or Flight**

- Blood flow is diverted **away from the uterus** and toward the heart, lungs and muscles
- May also **stall labor** as an evolutionary mechanism in the presence of danger



- **Other possible pathways that slow labor**

- Elevations in  $\beta$ -endorphins which reduce central oxytocin
- Reduction in oxytocin by catecholamines
- Inhibiting effects of stress on pulsatile oxytocin release

# Benefits of a low stress birthing environment



- Increased **labor progress**
- Improved **maternal coping** and less need for pain medications
- Increased uterine blood supply & **placental perfusion**
- Promotion of **breastfeeding and maternal-infant attachment**
- Decreased **postpartum hemorrhage risk**

# How to support beneficial hormonal action when unpreventable stress does occur?



- Provide **labor support, such as doula care**, to laboring women to reduce stress and its impacts.
- Ensure early and **uninterrupted maternal-newborn skin-to-skin contact**. This may reduce stress hormones for both, and benefit newborn transition and breastfeeding initiation. Oxytocin elevations and stress hormone reductions may also reduce the risk of PPH.
- Support **early initiation of breastfeeding**, which also promotes the release of calming, rewarding hormones for mother and baby.



Precautionary  
Point

*“Both animal and provisional human research suggest adverse effects of labor stress. Possible impacts include prolonged labor and fetal hypoxia, with increased morbidity and mortality in animal studies. Slow labor and suspected fetal hypoxia are common reasons for labor interventions.*

***Reducing stress in laboring women may be a simple low-tech approach with substantial benefits including reduced need for interventions.”***

# Early Skin-to-Skin Contact (SSC)



Separation of mothers and babies is common practice in many facilities, particularly in relation to Cesarean section, episiotomy or laceration repair, or newborn examination and routine care.

# Through the lens of hormonal physiology



# What if separation is necessary?



- Skin-to-skin contact is beneficial even after the first sensitive hour after birth
- Breastfeeding, like SSC
  - Releases oxytocin, prolactin and  $\beta$ -endorphins
  - All soothing and rewarding hormones for mother and baby
  - Can optimize hormonal physiology and reduce stress for mother and baby at any time

# References



1. Romano AM, Lothian JA. Promoting, protecting, and supporting normal birth: A look at the evidence. *J Obstet Gynecol Neonatal Nurs*. 2008;37:94-105.
2. Hatem M, Sandall J, Devane D, Soltani H, Gates S. Midwife-led versus other models of care for childbearing women. *Cochrane Database Syst Rev*. 2008;(4).
3. Low LK, Seng JS, Miller JM. Use of Optimality Index-United States in perinatal clinical research: A validation study. *J Midwifery Womens Health*. 2008; 53:302-309.
4. Cragin L, Kennedy HP. Linking obstetric and midwifery practice with optimal outcomes. *J Obstet Gynecol Neonatal Nurs*. 2006;35:779-785.
5. Goer H, Romano A, Sakala C. *Vaginal or Cesarean Birth: What is at Stake for Women and Babies? A Best Evidence Review*. New York: Childbirth Connection; 2012.
6. Schwartz E. Infant feeding: seeing the whole picture. Paper presented at First Food Forum; Atlanta; GA, 2013
7. Hodnett ED. Pain and women's satisfaction with the experience of childbirth: A systematic review. *Am J Obstet Gynecol*. 2002;186:S160-S172
8. Truven Health Analytics. *The Cost of Having a Baby in the United States*. Ann Arbor, MI: Truven Health Analytics; 2013.
9. Johantgen M, Fountain L, Zangaro G, Newhouse R, Stanik-Hutt J, White K. Comparison of labor and delivery care provided by certified nurse-midwives and physicians: A systematic review, 1990 to 2008. *Womens Health Issues*. 2012;22:e73-e81.

# References, con't



8. Hodnett ED, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. *Cochrane Database Syst Rev.* 2012;29:7-18.
9. Gregory KD, Jackson S, Korst L, Fridman M. Cesarean versus vaginal delivery: Whose risks? Whose benefits? *Am J Perinatol.* 2012; 87:229-243.
10. Hyde MJ, Mostyn A, Modi N, Kemp PR. The health implications of birth by Cesarean section. *Biol Rev Camb Philos Soc.* 2012;87:229-43.
11. Newburg DS, Walker WA. Protection of the neonate by the innate immune system of developing gut and of human milk. *Pediatr Res.* 2007;61:2-8.
12. Moore ER, Anderson GC, Bergman N, Dowswell T. Early skin-to-skin contact for mother and their healthy newborn infants. *Cochrane Database Syst Rev.* 2012;5.
13. Clark SL, Simpson KR, Knox GE, Garite TJ. Oxytocin: new perspectives on an old drug. *Am J Obstet Gynecol.* 2009;200:35.e1-35.e6.
14. Declercq ER, Sakala C, Corry MP, Applebaum S, Herrlich A. *Listening to Mothers III: Pregnancy and Birth.* New York: Childbirth Connection; 2013.
15. Buckley, SJ. *Hormonal physiology of childbearing: Evidence and implications for women, babies, and maternity care.* Washington, D.C.: Childbirth Connection, 2015.