

Hormonal Physiology of Childbearing: Evidence and Implications for Women, Babies, and Maternity Care



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Recommendations to Promote, Support, and Protect Physiologic Childbearing



Childbirth Connection

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Recommendations to Promote, Support, and Protect Physiologic Childbearing

(**Note:** Numbers in the text below refer to chapters and sections in *Hormonal Physiology of Childbearing*.)

*Physiologic childbearing confers valuable benefits to women and babies in the short, medium, and likely longer terms. Benefits of hormonal physiology accrue, so that any safe enhancement of hormonal physiology will likely benefit women and babies to some degree. Greater conformity with physiologic processes is likely to be more beneficial than less conformity. Additional benefits are also likely from averting potential harms associated with unneeded interventions. The synthesis presented in *Hormonal Physiology of Childbearing* supports a series of recommendations for safely optimizing hormonal physiology within maternity care.*

Currently available research, as presented in *Hormonal Physiology of Childbearing*, consistently finds that physiologic childbearing confers valuable benefits to women and their babies in the short, medium, and likely longer terms. The benefits that accrue from optimizing hormonal physiology for mother and baby extend along a continuum, according to this framework, with greater benefits likely for any mother and baby with greater experience of physiologic processes. Additional benefits from averting unneeded maternity care practices that have potential to harm women and babies, both known harms and any that are currently unknown, also likely extend along a continuum.

Maternity care systems could be readily adapted to safely optimize hormonal physiology for mothers and babies. As detailed below, adaptations of the system could include:

- ▶ promoting factors such as professional education, competencies of personnel, protocols, performance measures, quality improvement initiatives, innovative payment and delivery systems, and research
- ▶ supportive practices directly available to women from pregnancy through the postpartum period, such as reducing pregnancy stress as far as possible, primarily using comfort measures for labor pain and progress, and keeping mothers and newborns together after birth
- ▶ protecting women and babies, whenever possible and safe, from practices that disturb healthy physiologic processes

The following high-level recommendations are provided to encourage those who plan, provide, or receive maternity care to help women and newborns experience healthy physiologic processes. The recommendations apply broadly. They do not exclude the timely, appropriate, and safe use of maternity care procedures, medications, and other interventions when needed for the well-being of women and babies, in which case the recommendations can help maximize hormonal physiology as far as possible, and safely move women and babies along the salutogenic continuum.

The Appendix to *Hormonal Physiology of Childbearing* identifies selected resources that support implementation of these recommendations for professionals, and for women and childbearing families.

1. Education, Policy, and Consumer Engagement Recommendations

Education

Educate all maternity care providers in the hormonal physiology of childbearing.

RATIONALE: Shared knowledge and skills for optimizing hormonal physiology as far as possible for each mother and baby are foundational for all maternity care providers. This will foster provision of high-quality care, effective care teams, and more judicious use of maternity care interventions.

GUIDANCE: It is optimal for all members of teams caring for women and newborns to have a shared basis of understanding of the hormonal physiology of childbearing, including hormonal processes and their benefits, policies and environments that promote them, essential skills and knowledge to support and protect them from disruption whenever possible, and any unintended effects of common maternity care practices on them. This will enable a more complete and accurate assessment of possible benefits and harms. It is important for health professionals to be able to provide physiologic care to the extent safely possible for women and babies with special conditions, needs, and care requirements.

This knowledge and associated skills, along with a meaningful practical experience of physiologic childbearing, should be a foundational component of all levels of professional education within all of the disciplines that care for childbearing women and newborns. These subjects should be introduced in entry-level education, well represented during more advanced professional training, and prioritized within continuing education, including maintenance of certification programs.

Policy

Use effective quality improvement strategies to foster reliable access to physiologic childbearing.

RATIONALE: Given the considerable potential gains for maternal-newborn health and well-being from more reliable experience of physiologic childbearing, a priority for quality improvement initiatives is to foster spread of conditions that make such experiences widely available.

GUIDANCE: Implementation science helps identify effective quality improvement strategies. These include: addressing physiologic childbearing within quality collaboratives, developing relevant performance measures and using them for quality improvement, developing and implementing protocols that promote physiologic childbearing, using innovative payment and delivery systems to foster appropriate care practices, and implementing evidence-based clinical practice guidelines including those to safely reduce use of cesarean section and other consequential interventions.

Strengthen and increase access to care models that foster physiologic childbearing and safely limit use of maternity care interventions.

RATIONALE: Current evidence shows that physiologic birth is more likely under models of care that include birth centers, midwifery care, and doula support. These and other models and maternity care providers that prioritize and support physiologic processes should be encouraged. Facilities, maternity care providers and/or models of care with good safety outcomes and low rates of maternity care interventions likely are skilled in promoting, supporting, and protecting physiologic birth.

GUIDANCE: Within the context of collaborative practice, models of care that value, prioritize, and enhance physiologic processes should receive resource and policy support for broad access and reliable insurance coverage.

Professional development can help maternity care facilities and practitioners with limited ability to facilitate physiologic childbearing obtain the needed knowledge and skills to provide optimal care for healthy childbearing women and newborns.

Maternity care providers with skills and expertise in the care of women and babies with higher-risk and/or specific conditions provide critical maternity care services. The principles of physiologic birth are beneficially

applied to such care to optimize hormonal physiology of mothers and babies. For example, women with challenging conditions would likely benefit from one-on-one care in labor and skin-to-skin contact after birth. Similarly, breastfeeding in the early sensitive postpartum period following cesarean section is a priority. Models of care and protocols that safely apply these principles to women at higher-risk should be developed.

Engaging and supporting childbearing women

Use effective consumer engagement strategies to inform women about physiologic childbearing and involve them in related aspects of their care.

RATIONALE: From the perspective of the core principles of health care ethics—autonomy, beneficence, nonmaleficence, and justice—it is imperative to inform women of the beneficial innate hormonally-driven childbearing capacities of women and their fetuses/newborns and to support them in gaining access to such physiologic processes, as safe and appropriate.

GUIDANCE: A consumer booklet has been prepared as a companion to *Hormonal Physiology of Childbearing* (www.ChildbirthConnection.org/BirthPathway). This booklet, and related resources that can help women understand the hormonal physiology of childbearing, should be widely distributed and recommended to pregnant women and women planning pregnancy. Childbearing women should also have access to publicly reported results of performance measures that provide relevant information for choosing a care provider or group and a birth setting. Relevant content should be incorporated into childbirth education. Priority decision aids for childbearing decisions of great consequence should include relevant information and be routinely incorporated into maternity care practice. Providers and women are encouraged to engage in shared decision-making, which includes knowledge of options, best evidence of the potential risks and benefits inclusive of hormonal impacts, and consideration of the individual woman’s values and preferences.

All women should have access to care that safely supports physiologic childbearing and to care environments that promote such care and protect women from the harm of unneeded disturbance of physiologic processes, as described in the report. Where childbearing deviates from optimal hormonal physiology, or extra assistance or interventions are required, women should be fully supported to maximize hormonal physiology.

Journalists have a role to play in informing childbearing women and the general public about these matters.

2. Care Practice Recommendations Whenever Safely Possible

Prenatal care

Provide prenatal care that reduces stress and anxiety in pregnant women.

RATIONALE: Significant levels of stress and anxiety in pregnancy are detrimental to maternal and fetal physiology; they may adversely impact maternal well-being, gestational length, and fetal and child development. Some aspects of prenatal care, including fetal testing, may contribute to, or fail to reduce, maternal stress and anxiety.

Reduction of stress and anxiety in pregnancy may have significant and long-term benefits to offspring, and therefore substantial public health benefits. Evolving evidence suggests that some forms of relaxation and relaxation training may improve not only physiologic and hormone stress markers but also meaningful outcomes in mothers and babies. (See 5.2.1.)

GUIDANCE: Maternity care providers are encouraged to be aware of, and screen for, stress and anxiety in pregnancy, including in the context of pregnancy testing that could arouse anxiety. Current evidence suggests that effective relaxation techniques that reduce stress may favorably influence maternal emotional states, stress hormones, and responses; and fetal growth and behavior, premature birth rate, mode of birth, and newborn neurobehavior, among other impacts.

Foster the physiologic onset of labor at term.

RATIONALE: As described in *Hormonal Physiology of Childbearing*, maternal and fetal readiness for labor and birth at term, for postpartum transitions, and for ongoing well-being, including breastfeeding and maternal-infant attachment, are complex and incompletely understood processes that begin to develop in the weeks before the physiologic onset of term labor. Some of these processes may be ready only in the preceding days or hours. Scheduled birth, whether by induction or prelabor cesarean, will foreshorten these processes in mothers and babies, with potentially significant consequences for their physiologic transitions. With a prelabor cesarean, mothers and babies also miss beneficial processes of labor that activate maternal and fetal hormonal systems to optimize postpartum transitions of both. (See chapter 2.)

GUIDANCE: Maternity care providers are encouraged to support the physiologic onset of term labor and avoid induction and scheduled prelabor cesarean, except where indications for individual women are supported by high-quality evidence and informed decision making. From the perspective of hormonal physiology, when a scheduled cesarean is needed, waiting when possible for labor to start on its own may offer benefits to mothers and babies. This has not been well researched. Due to many currently unanswered questions about possible hormonally-mediated effects of scheduled birth, policies that support the physiologic onset of labor at term and discourage unneeded induction of labor or prelabor cesarean in healthy mothers and babies are prudent.

Encourage hospital admission in active labor.

RATIONALE: As discussed in *Hormonal Physiology of Childbearing*, the laboring female in all mammals is very sensitive to the environment. Disturbance in labor—including being in an environment that is not perceived as familiar, private, or safe—may slow or stop labor by increasing stress and stress hormone levels. Impacts on fetal blood supply are also possible. In women who plan hospital birth, moving from the familiar environment of home to the unfamiliar environment of hospital may slow labor, especially before the positive feedback cycles that progress labor are fully established, making labor less vulnerable to disturbance. These cycles may be slower to establish in primiparous than in multiparous women. Waiting for active labor before moving from home to hospital may reduce the risk of physiologic disruptions and is associated with increased likelihood of vaginal birth. (See “Childbirth and Stress” in 5.2.1; 4.2.1; and “Positive feedback cycles” in 3.1.3.)

GUIDANCE: Maternity care providers are encouraged to support women to remain at home until active labor is well established. Providing telephone support and/or a caregiver who is available to attend and assess the laboring woman at home, if needed, could be a cost-effective way to enhance physiologic processes, especially in first-time mothers.

Support privacy and reduce anxiety and stress in labor.

RATIONALE: As discussed above, disturbance in labor—including being in an environment that is not perceived as familiar, private, or safe—may slow or stop labor by increasing stress hormone levels, with potential impacts on fetal blood supply. (See “Childbirth and Stress” in 5.2.1, and 4.2.1.)

GUIDANCE: Maternity caregivers are encouraged to ensure that the physical and social environment for labor and birth and the early postpartum period helps the laboring women feel private, safe, and undisturbed. In addition, caregivers can provide support to reduce anxiety in labor. Ideally, this support is tailored to the laboring woman's individual requirements and begins in pregnancy with a discussion of her needs and possible comfort measures for labor. Establishing a trusting relationship with caregivers is also likely to be beneficial. Continuous labor support (doula care), as described below, may facilitate this.

Make non-pharmacologic comfort measures for pain relief routinely available, and use analgesic medications sparingly.

RATIONALE: As described in detail in *Hormonal Physiology of Childbearing*, the administration of opioid and epidural drugs in labor can have significant unintended effects on the hormonal physiology of mother and baby, in addition to other potential side effects. Disruption of the hormonal physiology in labor, birth, and the postpartum period by pharmacologic interventions and their co-interventions may also have detrimental effects on breastfeeding and maternal-infant attachment. When mother and baby are in good condition and coping well, it may be safer and preferable to offer non-pharmacologic comfort measures. This may reduce the need for pharmacologic interventions, with benefits for mother and baby. (See 3.2.4, 3.2.5, 4.2.4, 4.2.5, 5.2.4, 5.2.5, 6.2.4, and 6.2.5.)

GUIDANCE: Maternity care personnel who care for laboring women are encouraged to become skilled in, and to offer to women, non-pharmacologic comfort measures and other alternatives to pharmacologic pain relief in labor.

Make non-pharmacologic methods of fostering labor progress routinely available, and use pharmacologic methods sparingly.

RATIONALE: As described in detail in the report, the use of synthetic oxytocin to foster labor progress may have significant undesirable effects on the hormonal physiology of mother and baby, in addition to other potential side effects. Disruption of the hormonal physiology in labor, birth, and the postpartum period by pharmacologic interventions may also have detrimental effects on breastfeeding and maternal-infant attachment. Routinely making non-pharmacologic measures to foster labor progress available may reduce the need for these interventions, with benefits for mother and baby. (See 3.2.3 and 5.2.1.)

GUIDANCE: Maternity caregivers are encouraged to become skilled in and offer to the women in their care, alternatives to pharmacologic methods to foster labor progress. When mother and baby are in good condition, it may be safe and preferable to allow labor to progress at a slower rate, with attention to any source of stress that may inhibit contractions. Simple measures that may foster progress by optimizing hormonal physiology include increasing the laboring woman's sense of privacy and safety and minimizing her anxiety.

Promote continuous support during labor.

RATIONALE: Continuous support during labor from a supportive companion (doula) has been shown to reduce the need for maternity care interventions, likely by reducing stress and stress hormones.

In addition, doulas are generally skilled in providing non-pharmacologic measures to deal with stress and pain and to foster labor progress, thus addressing preceding recommendations and reducing the need for stronger interventions and potential hormonal disruption. (See 5.2.1, 3.2.1, 4.2.1, and 6.2.1.)

GUIDANCE: Maternity care providers are encouraged to support the provision of doula care. This may be a cost-effective strategy for reducing stress and stress hormones, reducing interventions, and improving outcomes for mothers and babies.

Foster spontaneous vaginal birth and avoid unneeded cesareans.

RATIONALE: From the perspective of hormonal physiology, and from other perspectives beyond the scope of *Hormonal Physiology of Childbearing*, cesarean procedures that lack clear benefit for a woman and/or her baby may have consequential downsides. The report identifies many ways that cesareans may impede optimal postpartum transitions in women and newborns.

GUIDANCE: Maternity care professionals and professional societies increasingly recognize that current high cesarean section rates may be causing more harm than good to women and babies. Important resources to safely address cesarean overuse include evidence-based guidance documents and a national endorsed standardized cesarean section performance measure.

Hormonal Physiology of Childbearing identifies care pathways that can help women avoid unneeded cesareans. Care models that foster physiologic childbearing, noted above, are associated with reduced likelihood of cesarean section. Many quality improvement strategies, as discussed above, can contribute.

Postpartum care

Support early and unrestricted skin-to-skin contact after birth between mother and newborn.

RATIONALE: As described in detail in the full report, skin-to-skin contact (SSC) between mothers and babies after birth has significant favorable effects on the postpartum transitions and hormonal physiology of both. Skin-to-skin contact reduces stress and stress hormones, promotes oxytocin release (which may also reduce maternal bleeding), and may also benefit the new mother's prolactin system, with long-term optimizing of breastfeeding. Conversely, evidence reviewed in the report suggests that separation of mothers and newborns may provoke newborn stress and be detrimental to breastfeeding initiation and maternal mood. (See "Skin-to-skin contact" in 3.1.4, 3.2.7, 4.2.7, 5.2.7, and 6.2.7.)

GUIDANCE: Maternity care providers are encouraged to support immediate and unrestricted skin-to-skin contact, as the norm in the early postpartum period for mothers and newborns, who should only be separated in exceptional circumstances. This includes encouraging rooming in and may require new procedures and policies. Institutions can support this by securing the "baby friendly" designation of the Baby-Friendly Hospital Initiative (BFHI).

Support early, frequent, and ongoing breastfeeding after birth.

RATIONALE: Early and frequent breastfeeding, with unlimited newborn access to the mother and her breasts, has been shown to optimize breast-milk production and breastfeeding continuation, likely by optimizing hormonal physiology. The early days after birth may be a sensitive period for upregulation of the prolactin system in particular, with long-term impacts on breast-milk production. (See "Prolactin and Breastfeeding" in 6.1.4, 3.1.4, and 4.1.4.)

GUIDANCE: Maternity care providers are encouraged to support ongoing and unlimited postpartum contact between mother and newborn, with extra support if needed during early breastfeeding.

3. Research Recommendation

Identify and carry out priority research into hormonal physiology of childbearing, and routinely incorporate this perspective in childbearing research.

RATIONALE: *Hormonal Physiology of Childbearing* identifies many critical gaps in current knowledge in relation to both the hormonal physiology and the possible impacts of maternity care interventions on mothers and babies in the short, medium, and longer terms. Gaps include the frequent omission of priority medium-term outcomes including breastfeeding, maternal-infant attachment, and maternal emotional well-being, which are hormonally mediated and potentially susceptible to disruption of hormone systems through prior interventions and/or maternal stress. A related concern is the lack of long-term follow-up for possible impacts on offspring health and development. Biologically plausible effects on hormonally-related functions inside and outside reproduction, as described in each hormone chapter, also require high-quality research and long-term follow-up.

GUIDANCE: Researchers and the institutions that fund research in maternity care are encouraged to foster and carry out research to expand our understanding of the hormonal physiology of childbearing in mothers and babies, including:

- ▶ hormonally-mediated processes of physiologic childbearing
- ▶ shorter- and medium-term impacts of maternity care interventions that are discussed in the full report
- ▶ parallel impacts of other widely used but less researched interventions
- ▶ possible longer-term offspring outcomes of maternity care experiences, including developmental outcomes, impacts on long-term hormonal functioning, and epigenetic effects

Appropriate research designs and measurements include randomized controlled trials, whenever applicable and possible.

High-quality studies are particularly needed that investigate consequential and biologically plausible, but as-yet poorly examined, impacts of maternity care practices and interventions on the medium- and long-term health and well-being of mothers and babies. These include outcomes of labor induction, augmentation, opioid and epidural analgesia, and cesarean section, and of stress in childbearing. Effective strategies to reduce stress and incorporate stress reduction support into prenatal care are also needed.

About the National Partnership for Women & Families

At the National Partnership for Women & Families, we believe that actions speak louder than words, and for four decades we have fought for every major policy advance that has helped women and families.

Today, we promote reproductive and maternal-newborn health and rights, access to quality, affordable health care, fairness in the workplace, and policies that help women and men meet the dual demands of work and family. Our goal is to create a society that is free, fair and just, where nobody has to experience discrimination, all workplaces are family friendly and no family is without quality, affordable health care and real economic security.

Founded in 1971 as the Women's Legal Defense Fund, the National Partnership for Women & Families is a nonprofit, nonpartisan 501(c)3 organization located in Washington, D.C.

About Childbirth Connection Programs

Founded in 1918 as Maternity Center Association, Childbirth Connection became a core program of the National Partnership for Women & Families in 2014. Throughout its history, Childbirth Connection pioneered strategies to promote safe, effective evidence-based maternity care, improve maternity care policy and quality, and help women navigate the complex health care system and make informed decisions about their care. Childbirth Connection Programs serve as a voice for the needs and interests of childbearing women and families, and work to improve the quality and value of maternity care through consumer engagement and health system transformation.