

Promoting Maternal-Newborn Bonding During the Postpartum Period

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Abstract

The bond between a mother and her newborn is one of strength, power, and potential. Several factors take place during the early postpartum period that can have a large influence on the bonding that occurs during this time. Oxytocin plays a vital role in the chemistry aspect of bonding, and its effects can be enhanced by a variety of techniques. Psychological theories such as the John Bowlby and Mary Ainsworth's Theory of Attachment and Erik Erikson's developmental stage of trust versus mistrust can be applied to the bonding process. The abundant benefits of bonding for both mother and newborn are of extensive importance. Nurses and childbirth educators can promote the maternal-newborn bond through encouraging skin-to-skin contact, breastfeeding, eye contact, and newborn massage during the first postpartum hour. Common hindrances to the maternal-newborn bonding process include a preterm newborn, lack of support, maternal fatigue, a cesarean birth, and emotional stress. Personal testimonies from families who have experienced these barriers can be used to evaluate strategies for overcoming these barriers in a way that promotes bonding. It is recommended for hospital protocols to include an hour of uninterrupted skin-to-skin contact after vaginal and low-risk cesarean births in order to promote optimal maternal-newborn bonding.

Promoting Maternal-Newborn Bonding During the Postpartum Period

From the moment a new mother hears her newborn's first cry, a crucial process of bonding that began at conception begins to take on a whole new importance. Regardless of race, gender, culture, or ethnicity, the bonding between a newborn and mother is a beautiful, natural process that has occurred from the beginning of time. The power of first impressions is well known, and none may be more significant than the first experiences of a newborn exiting a mother's womb (Phillips, 2013). What occurs during the early postpartum period can carry lifelong implications for both mother and newborn. Therefore, it is important to implement interventions to enhance the bonding process and overcome barriers that may hinder it from occurring.

The Role of Oxytocin in Bonding

In order to be most effective at promoting maternal-newborn bonding, it is important to understand how the bonding process occurs on a chemical level (Palmer, 2013). The human interactions that a newborn experiences during the early postpartum period plays a large role in the development of a newborn's hormonal control systems and permanent organization of brain synapses. A large part of the bonding experience can be attributed to the role of oxytocin. Therefore, it is especially important to maximize the release of oxytocin during labor and during the postpartum period in order to initiate the bonding and attachment pathways in the newborn's brain.

Oxytocin is the most abundant neuropeptide found in the brain that provides the foundation for the capacity to form close relationships with others (Feldman, Gordon, & Zagoory-Sharon, 2011). It is roused by high levels of estrogen during pregnancy which dramatically multiplies the mother's sensitivity to the presence of oxytocin and promotes

maternal behaviors (Palmer, 2013). The first major surge of oxytocin occurs throughout labor and during the passage through the birth canal. These surges play a role in preparing the woman for motherhood. Oxytocin is released from the posterior pituitary during the postpartum bonding process and helps reduce any negative symptoms that may be experienced by new mothers, such as anxiety or stress (Feldman et al., 2011). This helps cement the bond between the mother and newborn after childbirth, even though the mother may be having some anxiety lingering after an extensive laboring process. Oxytocin also creates a desire for further contact between the individuals inciting its release (Palmer, 2013). Oxytocin aids in creating a sense of comfort for the newborn while also further facilitating the mother's appropriate response of affection and attention (Feldman et al., 2011). The increased level of oxytocin helps the mother handle the stress of becoming a new parent. This is because oxytocin is linked to the central nervous system's regulation of stress and anxiety through binding mostly in the limbic system and amygdala.

Oxytocin can also be released during breastfeeding which enhances the bonding process. A study by Gordon, Zagoory-Sharon, and Leckman (2010) showed high oxytocin levels associated with breastfeeding are correlated with mothering instincts such as affectionate parenting behaviors, a soft and soothing vocal tone, the expression of positive affect, and affectionate touch. They found there is a correlation between a woman bonding well with her baby and the amount of oxytocin found in her blood. During their study, blood was drawn from the mother's antecubital vein 30 minutes before nursing and 30 minutes after nursing. The amount of oxytocin was determined by a commercial oxytocin enzyme-linked immunosorbent assay kit and calculated by using a

MATLAB-7 program according to relevant standard curves. The mother was videotaped interacting with her newborn for 10 minutes before and after breastfeeding. Their interaction was scored according to four categories including the mother's gaze to her infant's face, parental affect, vocal tones, and affectionate touch. The study found that after breastfeeding, oxytocin levels were higher, and the mothering instincts were more prominent.

The touch of the newborn's lips on the mother's nipple has been found to raise oxytocin levels shortly after birth (Himani, Kaur, & Kumar, 2011). This further complements the physiologic, immunologic, and behavioral mechanisms that contribute to maternal-newborn bonding. These mothering moments further support the production and release of oxytocin. This surge in oxytocin levels results in the mother becoming more familiar with and attracted to the unique odor of her newborn. The response from the mother lays the foundation for many future developments of bonding and attachments making this early bond one of the most important connections an infant can make.

Theories of Bonding and Attachment

Several theories offer descriptions of how bonding during the first postpartum hour lays the foundation for the attachment process that continues throughout childhood (Feldman et al., 2011). Research on maternal-newborn attachment began to increase in popularity around the 1970s. John Bowlby, a British psychiatrist, and Mary Ainsworth created the Theory of Attachment, which described bonding as a continuing process during which the child creates an attachment to the mother. This attachment that commenced during infancy impacts the couplet throughout their lives. Bowlby acknowledged that initial bonding process early in the postpartum period provides the

foundation necessary for numerous future emotional, developmental, and social milestones (Young, 2013).

Attachment can be defined as “a strong disposition to seek proximity to and contact with a specific figure and to do so in certain situations, notably when frightened, tired, or ill” (Zeanah, Berlin, & Boris, 2011, p. 819). Therefore, though the mother may bond with her newborn, she is not considered attached to the newborn because she does not derive security, protection, or care from her newborn (Hazan & Campa, 2013).

Therefore, the newborn’s attachment bond to the mother is considered unidirectional and is categorized separately from the care giving bond established from the mother to the newborn, which is reciprocal. The phenomenon of maternal-newborn bonding has been a process researched for decades. John Bowlby was one of the first to extensively research the emotional bond between a newborn and parent. During the mid-to late 1900s, Bowlby evaluated the psychoanalytic theory that suggested a child’s emotional bond to the parent emerges and persists primarily because the mother provides physical necessities such as food for the child. Based on this theory, the emotional bond between a newborn and mother primarily reflects a secondary drive to obtain these physical necessities, implying there is nothing inherently extraordinary about the maternal-newborn relationship.

Bowlby countered this theory after observing orphaned children longing for their deceased parents. Even several years after their parents’ death, the children failed to form new bonds to other adults who did attend to their physiological needs. After these observations, Bowlby began to believe that perhaps the maternal-newborn bond did not emerge as a result of a secondary drive process, but rather other reasons that originate from the early postpartum period.

Through experiments with rats, Bowlby discovered when mothers actively bond with their newborn during the early postpartum period through skin-to-skin contact, the production of corticotropin-releasing factor (CRF) is inhibited. Corticotropin-releasing factor targets glucocorticoid receptors in the hippocampus and gamma-aminobutyric acid receptors in the amygdala to mediate the stress response and anxiety. Furthermore, mothers serve as regulators of the newborn's pituitary-adrenal stress response system. These regulators of newborn stress reactivity may include touch, newborn massage, close body contact, and eye gazes. These findings suggest there are hidden regulators in the maternal-newborn bond that contribute to the attachment formation during the early postpartum period. Through these hidden regulatory mechanisms, the repeated reduction of stress experienced by the newborn in the presence of the mother could be partially responsible for the newborn's attachment because of the association of the mother with a safe haven and security. Though newborns are not born with this attachment, the original development begins during the postpartum period as the newborn begins to become familiar with his or her mother's smell and sound (Zeanah et al., 2011).

Erik Erikson recognized the primary stage of development during infancy is trust versus mistrust, during which the newborn gains the ability to trust others, a sense of one's own trustworthiness, and a sense of hope (Kneisl, 2013). Newborns need to develop a sense of trust that their feeding, comfort, stimulation, and caring needs will be met (Wilson, 2013). Erikson recognized a newborn who has developed trust will be able to experience a feeling of physical comfort and security which assists them in experiencing unfamiliar and new situations with minimal fear. When the parent demonstrates persistent skin-to-skin contact with the newborn accompanied by other

nurturing acts, the infant's cortisol levels are reduced as a result of this increase in oxytocin (Palmer, 2013). It has been demonstrated that the level of oxytocin controls the permanent organization of the stress-handling portion of the newborn's brain, thus promoting a secure or insecure attachment style that can carry over into adolescence and adulthood. If insecure attachments are formed during this early stage, the newborn is likely to experience estrangement and withdrawal from other potential attachment figures. Because of this trust that is acquired in infancy, the foundation is laid for all other succeeding phases of development. Therefore, it is especially important to promote optimal attachment during the postpartum period.

Importance and Benefits of Early Bonding

Before one can be motivated to promote maternal-newborn bonding, the importance and benefits of bonding must be explored (Young, 2013). The first hour of life after birth is known to be an optimal opportunity for the maternal-newborn bonding process to occur. However, this crucial window of time is often taken up by various medical and nursing procedures such as newborn weights, foot printing, and assessments which disrupt the bonding process. A newborn's behavior and subconscious thought processes can be affected by the early postpartum period (Phillips, 2013). Therefore, it is critically important for all those involved in the childbirth process including parents, nurses, and doctors to be aware of the importance of maternal-newborn bonding.

Another reason it is important to promote maternal-newborn bonding is highlighted by new research showing newborns are capable of forming memories that remain in their subconscious thoughts for life (Chamberlain, 2013). In his groundbreaking book entitled *Babies Remember Birth*, Dr. David Chamberlain compared

the birth stories of 10 mothers with the birth memories of their children. During separate sessions under hypnosis, mothers and their children were asked to describe the birth process. Although the children had not been told about their birth history, their accounts of the events surrounding their births contained many of the unique and specific details in common with the mother's account. Dr. Chamberlain's newest book entitled *Windows to the Womb* documented large bodies of research that explore the various ways newborns and even fetuses are able to demonstrate capacities for learning and memory. This information is important in several fronts. If newborns subconsciously remember the first few moments outside of the womb, then how they are treated at birth and during the first few hours following have a much larger influence on later years in life than most realize.

Since this parent-child bond is the basis for future bonding experiences, the importance lies in the maximum quality of the initial bonding experience (Young, 2013). The quality of the maternal-newborn relationship during the early moments after birth can have a significant impact on the mother's mental health and newborn's well-being, development, and adaptation throughout life (Johnson, 2013). The unique and long-term emotional tie that begins with the first contact between the mother and newborn continues to develop throughout the postpartum period. Therefore, an inadequate mother-newborn relationship can result in long-term consequences to the child, including cognitive and socio-economic development, physical health disparities, and difficulties in personal relationships.

Maternal-newborn bonding can also be beneficial because of its potential to enhance the development of the newborn's brain (Phillips, 2013). When a newborn is born, his or her immature brain is only about 25% of the size it will be in adulthood.

Even though all brain cells are present at birth, the myelination and synaptic development that will take place later in life is not yet complete. Dr. Allan Schore discovered the maturation of the amygdala undergoes a critical period of development that begins at birth and continues throughout the first two months of life. Dr. Schore's research proclaims skin-to-skin contact after birth activates the amygdala via the prefrontal orbital pathway. This activation contributes to the maturation of the amygdala. The amygdala is a part of the limbic system involved in emotional learning, as well as in seeking love and sustaining long-term emotional memories (Trigoboff, 2013). When these long-term emotional memories are established due to proper maternal-newborn bonding, the relationship between mother and child can be enhanced.

Promoting Bonding

Research has shown the first hour after birth is when the strongest foundation for bonding occurs (Young, 2013). Therefore, childbirth staff need to be cognizant of how to support bonding during this critical window of opportunity (Henry, Richard-Yris, Tordjman, & Hausberger, 2009). During the first hour of life, the neonate is most alert and naturally seeks both suckling and skin-to-skin touch. Therefore, when newborns are separated from their mother during the first hour of life, the couplet is more likely to experience a weaker initial attachment to each other. Nurses can promote a positive bonding and attachment experience by encouraging contact between the mother and newborn, thereby facilitating a positive emotional mood.

Breastfeeding during the first postpartum hour is one of the best ways to promote maternal-newborn bonding (McLeod, 2009). One of the reasons why breastfeeding aids in bonding can be described by the behavioral theory of attachment by classical

conditioning. The behavioral theory of attachment suggests a newborn forms an attachment with the caregiver who provides food and emotional comfort. When a newborn is born, he has no immediate attachment to his mother. However, when he is breastfed, he begins to learn to associate his mother with the comfort of being fed. Being close to the mother's breast also creates a sense of comfort for the newborn that can aid in the bonding process. This is because the baby is born knowing the smell of amniotic fluid which is similar to the scent of the mother's breast (Palmer, 2013). Therefore, through the process of classical conditioning, the newborn comes to find the contact with his or her mother comforting (McLeod, 2009).

Early breastfeeding can also aid in the release of oxytocin by stimulating the milk let down reflex which can help make the first attempt at breastfeeding more successful. Nursing a newborn during the first postpartum hour causes an increase in oxytocin levels. Therefore, when breastfeeding is delayed or never initiated, the couplet loses part of the hormone peak that takes place immediately after birth (Palmer, 2013). When a newborn's hand massages the mother's breast during a feeding, the mother releases more oxytocin which further aids in the bonding process (Phillips, 2013). Oxytocin is also transferred to the newborn through breast milk which promotes continuous relaxation and closeness for both mother and baby (Palmer, 2013). Kayla Johnson (2013) found mothers who initiated breastfeeding within the first two hours after birth seemed more content and confident in their parenting abilities at one year after birth. The emotion and love formed during these early moments greatly enhance the maternal-newborn bond (Bussel, Spitz, & Demyttenaere, 2010). When oxytocin and prolactin hormones are released during

breastfeeding, the mother is likely to have lower levels of stress and enhanced bonding with her newborn (Liu, Leung, & Yang, 2014).

Himani, Kaur, and Kumar (2011) researched the effect of initiation of breastfeeding within one hour of the delivery on maternal- newborn bonding. A total of 218 couplets were enrolled in their study. The control group consisted of 109 couplets who initiated breastfeeding more than one hour after birth. The experimental group consisted of 109 couplets who did initiate breastfeeding within one hour of birth. During the experiment, mothers were not forced to initiate breastfeeding immediately nor delay the initiation for the sake of the experiment. Instead, mothers were contacted one hour after the delivery of their newborn and asked when they initiated breastfeeding. If it was within one hour of delivery, they were placed in the experimental group. If it was more than one hour, they were placed in the control group. Maternal-newborn bonding was assessed at 24 and 48 hours after delivery using the Maternal Postnatal Attachment Scale.

The Maternal Postnatal Attachment Scale was developed by John Condon and Carolyn Corkindale in 1998 (Condon & Corkindale, 1998). The self-report questionnaire features 19 questions that address areas of bonding and attachment such as “pleasure in proximity, acceptance, tolerance, and competence as a parent” (Condon & Corkindale, 1998, p. 57). Using the scale, the control group had a mean bonding score of 73.6, while the experimental group had an average bonding score of 81.1 at 24 hours after delivery (Himani et al., 2011). At 48 hours postpartum, the control group had a mean bonding score of 74.5 and the experimental group had an average bonding score of 83.3. It is acknowledged that quantifying the maternal-newborn bonding is a difficult challenge for researchers because it involves the psychological study of the mother and her attachment

to the neonate. Upon results analysis, a significant difference was found between the maternal newborn bonding scores of the control and experimental groups. The research team recommended that breastfeeding be initiated within one hour of delivery, as long as maternal and newborn health allows, in order to promote optimal maternal-newborn bonding. The establishment of early breastfeeding can encourage a high quality maternal-newborn attachment throughout infancy. During the first postpartum hour, the newborn is most alert and the sucking reflex of the neonate is the most active. Therefore, when babies are put to breast during the first hour after delivery, the mother and newborn are able to take advantage of this peak time. Not only are newborns particularly alert and apt to breastfeed during the first postpartum hour, but new mothers are also particularly sensitive during the immediate postpartum period. Therefore, the early first contact of mother and newborn seems to optimize attachment and bonding of the mother to the newborn.

Himani et al. also conducted a study to find the relationship between early initiation of breastfeeding and the long term success of breastfeeding. The study involved 111 primiparous women who intended to breastfeed their newborns. These women were placed into groups that were matched for social class and age. The sample was divided into two groups, with half of the women breastfeeding within 10 minutes of birth and the other half initiating breastfeeding four to six hours after birth. Results showed the group who began breastfeeding within minutes of delivery breastfed their newborns for an average of 161 days, which was 40% longer than the group who initiated breastfeeding several hours after birth. This is a difference of about 96 days. Therefore, it can be recommended that early contact between mothers and newborns is promoted in

order to maximize bonding during this maternal sensitive period. Himani et al. (2011) concludes that “Prolonged breastfeeding appears to be one of the outcomes of promoting early contact of mother-newborn pairs” (p. 101). Because breastfeeding is a significant source of bonding throughout infancy, these results are important to consider.

An additional way to promote bonding is through the encouragement of eye contact between the mother and newborn during the first hour after birth (Davidson, London, & Ladewig, 2012). After birth, the new mother should increase the proportion of time she spends in the en face position with her newborn. The en face position involves direct face-to-face and eye-to-eye contact between the mother and newborn. When the newborn’s eyes are open, the mother instinctively greets the newborn and talks in high pitched tones to him or her. These are signs that active bonding is taking place. The nurse can play a vital role in promoting the effects of this eye contact after birth. For example, nurses can delay the administration of Erythromycin in the newborn’s eyes until this critical hour has passed in order to avoid clouding the vision of the newborn.

Maternal-newborn bonding can also result from positive moments of maternal-touch-massage during the first postpartum hour (Feldman et al., 2011). Mothers can be encouraged to use newborn massage as a way to increase the bonding and relaxation process during the postpartum period (Arivabene, 2010). In a study done by Field, Diego, and Hernandez-Reif (2010), the effects of newborn massage during the postpartum period were explored. During the experiment, newborn newborns were randomly assigned to a massage therapy or to a control group. The experimental group using massage therapy received three, 15-minute massages each day for five consecutive days. The massage consisted of moderate pressure stroking to the shoulders, back, head, legs, and arms as

well as kinesthetic exercises involving extension and flexion of the limbs. The study found newborn stress behaviors and activity were significantly reduced which suggests massage has a pacifying and stress-reducing effect on newborn newborns. This can beneficially assist the bonding process because it can relieve some of the stress that accompanies delivery. As a part of postpartum newborn massage, the nurse can encourage the mother to familiarize herself with her newborn through fingertip exploration of the newborn from head to toe (Davidson et al., 2012). The mother can also familiarize herself with the newborn through a sense of sight, touch, and hearing. Mothers who participate in infant massage are more likely to respond verbally to any sounds emitted by the newborn such as cries, coughs, sneezes, and grunts. These verbal responses also indicate active bonding is taking place.

Finally, skin-to-skin contact, also known as kangaroo care, between the mother and newborn has been shown to be associated with a wide variety of physical and psychological benefits for both the newborn and mother (Brimdyr, 2011). When a newborn is allowed to have uninterrupted skin-to-skin contact with his or her mother after birth, the newborn goes through nine instinctive stages during the first postpartum hour that promote bonding and attachment early on. Stage one involves the birth cry that allows the newborn's lungs to expand. The second stage consists of relaxation when the newborn demonstrates few movements. Next is the awakening stage which typically occurs while the newborn is three to eight minutes old. During this stage, the newborn exhibits small thrusts of movement in the head and shoulder. The fourth stage is the activity stage where the newborn demonstrates the rooting reflex while making increased mouthing and sucking movements.

The stage of rest follows, during which the newborn is likely to sleep. Stage six generally occurs 35 minutes after birth and consists of the newborn crawling towards the breast to reach the nipple. This is when it is especially important that the breast is made available to the newborn in order to take advantage of this peak time of activity. The seventh stage begins about 45 minutes after birth and involves the newborn becoming familiarized with the mother by massaging her breast and licking the nipple. This stage can last up to 20 minutes. Following is the eighth stage, during which the newborn generally self attaches to the nipple and suckles. This is a vitally important early experience of learning to breastfeed. Within 1.5-2 hours after birth, the newborn will enter into stage nine which is the sleep stage. If at any point during the first postpartum hour the newborn is lifted from the mother's chest, the newborn will become distressed and disoriented and will have to restart the nine instinctive stages, which delays breastfeeding success (Phillips, 2013). Therefore, if the newborn is not skin-to-skin during the first hour after birth, the peak opportunity to promote bonding will be missed.

Skin-to-skin contact allows for several physiologic benefits that all contribute to maternal newborn bonding during the postpartum period (M. Fitzgerald, personal communication, February 25, 2015). One pertinent benefit of skin-to-skin contact after a vaginal delivery is the analgesic effects it can have for the mother. The time period immediately following a vaginal delivery can be quite painful for the mother due to frequent fundal massages and any tearing that occurred to the perineal area during delivery. However, having the newborn lay prone on the mother's chest after birth is an excellent distraction to the pain the mother may be experiencing.

Studies by Arivabene (2010) showed when the mother has direct skin-to-skin contact with her newborn during the first postpartum hour, the newborn later shows reduced levels of plasma cortisol levels when compared to newborns who have not had similar skin-to-skin contact after birth. Cortisol is a hormone released from the adrenal cortex as a part of the body's natural response to stress (Lewis & Retherford, 2011). When the body is stressed, levels of cortisol will increase. Therefore, this reduced level of cortisol that occurs after skin-to-skin contact represents a reduction in the stress levels that the newborn experiences. Furthermore, kangaroo contact has been shown to increase the mother's confidence in her abilities to respond to her newborn's needs (Arivabene, 2010). John Bowlby articulates the defining feature of a secure attachment is the newborn's confidence in the responsiveness and availability of the attachment figure when a need exists (Hazan & Campa, 2013). Therefore, kangaroo care can aid in this attachment process early on.

Though many benefits of skin-to-skin contact are well known to health care professionals, many new mothers are unaware of the array of assets it has to offer (ICEA, 2013). The International Childbirth Education Association (ICEA) advocates for childbirth education curriculums to include information regarding the benefits and practices of skin-to-skin care during the postpartum period ranging from vital sign stabilization to the promotion of attachment. During classes such as Lamaze, educators can teach about the benefits skin-to-skin care has to offer for both mother and newborn including optimal adaptation to extra-uterine life during the first few hours of life. A new mother is most likely to comply with suggested skin-to-skin contact if she knows all about the physical benefits it can provide for the newborn. Therefore, in an effort to

promote maternal-newborn bonding, nurses can educate the mother about the physiologic profits skin-to-skin contact offers to both the mother and newborn.

A study involving 1025 mother-newborn dyads found skin-to-skin contact immediately following birth helped to stabilize newborn temperature and cardiorespiratory status, promote breastfeeding, reduce newborn crying and enhance maternal-newborn attachment (Davidson et al., 2012). Kangaroo care has been shown to result in better outcomes regarding heart rates, breathing patterns, cerebral and body oxygenation, metabolism, temperature control, growth, and weight gain when compared to traditional neonatal care (Anderzen-Carlsson, Lamy, Tingvall, & Erikson, 2014). Being skin-to-skin with the mother has been shown to stabilize glucose levels in the newborn, which can reduce the incidence of hypoglycemia commonly seen in newborns, especially when born to diabetic mothers (Phillips, 2013). Studies have shown this stabilization of glucose levels and body temperature to occur at a higher rate than babies left under warmers after birth.

Skin-to-skin contact also helps the newborn maintain an optimal body temperature which prevents the newborn from experiencing hypothermia, causing significant stress to the newborn. There is a thermal synchrony phenomenon that takes place whereby the temperature of the mother's chest increases to warm a cool newborn and decreases to cool an overly warm newborn. When a newborn enters the world for the first time, he or she is wet and easily chilled in the cool extra-uterine environment. Therefore, the newborn experiences a sense of comfort when warmed by the mother's chest, which further enhances the bonding process. Kangaroo care involves laying the newborn prone on the mother's chest, and is one of the simplest ways to support bonding

between the newborn and the mother (Arivabene, 2010). Premature newborns who have experienced kangaroo care have been shown to have a reduced need for extra oxygen (Newman, 2009). Preterm newborns requiring oxygen can be cared for skin-to-skin while receiving oxygen therapy.

If the mother's health prevents the possibility of doing skin-to-skin contact immediately after birth, babies can be held to the chest of the father or other family member to stabilize temperature and glucose levels until the mother is stabilized (Phillips, 2013). In addition, skin-to-skin contact between mother and newborn directly after birth also allows for the newborn to be colonized by bacterial similar to the flora found in the mother (Newman, 2009). When combined with breastfeeding, the newborn's likelihood of developing various allergic diseases decreases. When a newborn is put into an incubator, the skin and gut are often colonized by bacteria different from the mother's.

Furthermore, kangaroo care has been shown to decrease episodes of crying and increase the amount of time the newborn spends in the quiet alert state (Phillips, 2013). Meta-analyses have demonstrated improved rates of breastfeeding, mother newborn attachment, and improved maternal-newborn interaction in couplets who have utilized skin-to-skin care (Conde-Agudelo, Belizan, & Diaz-Rossello, 2014). Moreover, skin-to-skin contact increases oxytocin levels. Oxytocin is sometimes referred to as the hormone of attachment (Phillips, 2013). Johnson (2013) reported mothers who participate in immediate skin-to-skin contact are more sensitive to the needs of their newborn one year after birth when compared to women who did not.

Humans are not the only species that have a critical period of bonding and attachment during the first few hours after birth (McLeod, 2009). It has been discovered

that geese follow the first moving object they see during a critical period that takes place approximately 12-17 hours after hatching which suggests attachment is actually innate and programmed genetically. This event involving powerful imprinting for both mother and baby ideally occurs during the first postpartum hour so that mother and baby can recognize each other in the first week after birth (Palmer, 2013).

Nurses can also play a role in supporting maternal psychosocial well-being as a way of encouraging maternal-newborn bonding (Davidson et al., 2012). Becoming a mother involves an extensive amount of role changes and increased responsibilities. These can increase the emotional stress of a new mother and hinder the bonding process. Becoming a mother is a life-transforming process through which mothers establish maternal identity, including commitment, attachment, preparation, acquaintance, learning, physical restoration, and achievement of the new maternal identity. This process requires extensive psychological, social, and physical work which requires the support of the postpartum nurse. Therefore, an interactive nurse-patient relationship is an excellent way to promote maternal-newborn bonding. The postpartum nurse can also promote maternal-newborn bonding by allowing the mother to participate in the newborn's care as much as possible. Many hospitals are promoting rooming-in couplet care where the mother and newborn stay in the same room as a couplet instead of the newborn staying primarily in a newborn nursery after birth. Couplet care allows the nurse to teach and role model the care of the newborn so the mother can have time to bond with her newborn and learn to care for him or her in a supportive environment. The role of the postpartum nurse should include encouraging the mother to be involved in any nursing interventions, planning, and evaluation with choices offered as much as possible. If the newborn is not

being breastfed, the mother should be encouraged to bottle feed her newborn for each feeding, rather than the nurse. The nurse can educate the mother about how breastfeeding should be done in an on-demand feeding schedule while the couplet is on the mother-newborn unit. The mother should also be encouraged to participate in the newborn's first bath and in diapering the newborn as needed. These efforts to encourage maternal involvement will increase the mother's self-confidence about her effectiveness as a parent. Nurses can offer positive feedback to the mother as she provides care for her newborn. Mothers need to hear it takes time, trial, and error for both mother and newborn to know what to expect of the other and how to meet each other's needs.

Barriers to Bonding

Some factors that have the potential to negatively affect the bonding process include a lack of support, the riskiness of the pregnancy, maternal fatigue, cesarean birth, and a lack of confidence in parenting abilities (Ross, 2012). If a woman lacks confidence in her mothering abilities, she is less likely to report a positive emotional bond to her baby. Research conducted by Ross reported women who have a high risk pregnancy are also more likely to have a lack of confidence and a more difficult time with bonding as compared to a woman with a healthy pregnancy. When evaluating barriers to bonding, it is important to identify the beliefs and perceived barriers held by both nurses and mothers.

Ferrarelo and Hatfield (2014) conducted a mixed method study involving surveys and focus groups with postpartum nurses and mothers in order to determine common causes of barriers to bonding during the postpartum stay. The study focused on both mothers' and nurses' understanding of barriers to skin-to-skin care (SSC) during the

postpartum period. The survey involved 14 postpartum nurses and showed all of the nurses realized SSC offered benefit to mothers and babies. However, the nurses agreed mothers and babies did not spend enough time SSC during their hospital stay. The nurses also ranked the top barriers to bonding during the postpartum period with visitors in the room (92.8%), others wanting to hold the newborn (71%), mothers not understanding the importance of SSC (50%), and maternal grogginess (43%) being the top four barriers. The surveys were also completed by 15 mothers who had given birth within the past 30 days. All mothers believed they had spent enough time SSC and that SSC was very important. Most mothers did not identify barriers to SSC; however, those that did rated “others wanting to hold the newborn (20.1%), grogginess (13.4%), and visitors in the room (6.7%)” as their top barriers (Ferrarello & Hatfield, 2014, p. 58). Two small focus groups with postpartum nurses revealed further thoughts regarding barriers to SSC. One nurse voiced having visitors in the room sometimes causes hours go by without a feeding because mothers are often hesitant to pump and/or feed when family and friends are in the room. First time mothers may be especially hesitant about disrobing to allow for breastfeeding and/or SSC. One mother voiced during the focus group that in the hospital, breastfeeding was all new and she did not feel comfortable attempting it with other people around. It was observed the amount of time mother/newborn couplets were interrupted by visitors, staff, or phone calls during the first postpartum day outweighed the amount of time mothers had alone with their newborn.

Soon after birth, the woman enters a period referred to as taking-in and taking-hold (Davidson et al., 2012). During this time, a lack of confidence can negatively impact the maternal-newborn bonding process. The taking-in period involves the new mother

feeling somewhat passive and dependent in the care of her newborn. The taking-hold phase involves the mother feeling more ready to mother and resume control of her body. The nurse can play a vital role during these periods to promote maternal confidence. For example, if the newborn spits up after breastfeeding, the mother may view it as a personal failure in her parenting abilities. Therefore, the nurse should educate the new mother that this is not to be viewed as a failure, but rather as a common finding in newborns. A woman's parenting confidence may also be depleted if she sees others handle her newborn proficiently and confidently while she still feels unsure and tentative due to a lack of experience with newborns. The nurse can encourage the mom and let her know confidence will come with time. The postpartum nurse should be aware of each patient's unique situation and parenting abilities. The education and knowledge regarding newborn care will also vary greatly from patient to patient. Some mothers will have strong family support systems and others will not. Therefore, the nurse should assess each patient's needs to determine what resources may be appropriate to refer them to if necessary.

It is also common for women who gave birth via cesarean section to feel angry or frustrated that they were not able to give birth vaginally (Weisman et al., 2010). Some women feel disempowered and perceive a cesarean as a devastating loss if their ideal birth plan involved a vaginal delivery (Udy, 2009). It has been shown that women who have had cesarean sections have a higher rate of voluntary secondary infertility with the purpose of preventing another pregnancy. This is often due to their determination that the physical and emotional trauma was perceived as too much to repeat. One study showed women who underwent a cesarean section to have their first baby were 12% less likely to have another baby than women who gave birth vaginally. These findings exposed the

need for nurses to promote the empowerment of women through the cesarean process and enhance the maternal-newborn bonding during the postpartum period as much as possible.

Women are also often disappointed when they are not able to hold and breastfeed their newborn immediately after birth (Phillips, 2013). These emotions negatively impact the bonding connection during the postpartum period. Therefore, it is important for the nurse and caregivers to encourage the mom during this time and let her know having a cesarean section in no way means she is incompetent, but rather it was just the safest decision for the health of her and the newborn. When a cesarean section is necessary, the nurse can implement several strategies to promote an optimal bonding experience. Many birthing units are aware that skin-to-skin contact after a vaginal birth offers a wide range of benefits for both mother and newborn. However, few hospitals have implemented skin-to-skin contact in the operating room after cesarean births. Nevertheless, as long as the mother and newborn are medically stable, there are few cases where skin-to-skin contact should not be implemented. Anesthesiologists have reported how amazing the effect of skin-to-skin contact after delivery has on the stabilization of the mother. When a new mother has her newborn on her chest, her perception of pain is decreased and her anxiety level significantly diminishes, which results in increased stability of heart rate and blood pressure. Furthermore, it promotes temperature stability for the newborn which reduces the stress that hypothermia may cause. When both mother and newborn are stable, skin-to-skin contact can be one strategy used to promote bonding after a cesarean section.

Another factor that can significantly influence the bonding process is support offered by the father and other family members (Young, 2013). Having this support system raises the mother's confidence in her parenting abilities and reduces the likelihood of postpartum depression. When a woman experiences postpartum depression and/or postpartum fatigue, she is less likely to demonstrate affectionate touching or respond in loving ways to her newborn's needs, which leads to negative bonding outcomes (Weisman et al., 2010). In addition, their newborns are more likely to experience social functioning deficits, depressed maternal mood, and emotional concerns. Therefore, the nurse should educate the family about the important role a support system has on the bonding process and ideas of what can be done to enhance the process.

The postpartum nurse can help combat the effects maternal fatigue may have on the bonding relationship by promoting opportunities for rest after birth (Davidson et al., 2012). This may include limiting visitors and providing a comfortable place for the significant other to sleep to promote a smooth postpartum transition. Though having visitors in the postpartum room has been shown to be a potential barrier to skin-to-skin care and breastfeeding, the solution to this is not to ban all visitors. It is healthy and normal for visitors to be present during the postpartum time. Nevertheless, certain modifications can be offered to hospital protocols that will optimize bonding. One option is the promotion of afternoon quiet time during which visitors are restricted and mothers can enjoy uninterrupted time with their babies (Ferrarello & Hatfield, 2014). When this was suggested by Ferrarello and Hatfield, both mothers and nurses involved in the study were enthusiastic about this proposition. Some hospitals, such as Virginia Baptist in Lynchburg, VA, have adopted quiet hours from 1:30-3:30 pm during which nurses cluster

their care and discourage visiting to allow mothers and babies this time of uninterrupted bonding (A. Hicks, personal communication, February 1, 2014). Another suggestion is to provision of privacy signs to hand on the door of hospital rooms during breastfeeding (Ferrarello & Hatfield, 2014). It has been shown when mothers are provided a privacy sign, mothers are significantly more likely to characterize breastfeeding as successful. In order to address the barrier of maternal exhaustion and/or grogginess, the postpartum nurse can allow the mother's care partner to hold the newborn skin-to-skin to allow the mother time to rest and recover from medication therapy. Mothers can also be provided with a specialized garment to wear that keeps the newborn skin-to-skin without the risk of the newborn falling. These measures will promote optimal levels of energy for the mother to participate in active bonding.

An additional series of barriers to the bonding process occurs when a newborn is born preterm or unhealthy (Fegran, Helseth, & Fagermoen, 2008). Newborns who require immediate care in an intensive care nursery are often separated from the mother immediately after birth. Therefore, premature newborns are considered to be at a high risk for having a negative bonding experience, primarily due to the fact that most premature newborns have to spend their first few days of life under neonatal intensive care. This separation can interfere with the normal maternal-newborn attachment process (Davidson et al., 2012). When the first few hours of life include intubation, resuscitation, and oxygen therapy, the newborn and mother miss out on the peak time of bonding during the first hour after birth. When the health of the mother or newborn prevents extensive amounts of bonding during the first postpartum hour, other considerations of ways to get creative with bonding techniques can be given. Many mothers of preterm

newborns are able to have skin-to-skin contact with their newborn for short periods of time while their newborn is in an intensive care nursery. However, if the newborn is in an incubator and cannot be held due to medical instability, the mother can be encouraged to stroke the newborn's hand, foot, or cheek in an aseptic manner.

Dr. David Wheeler, professor of Evangelism at Liberty University, and his wife Debbie, have experienced the difficulties of bonding with a premature newborn (David Wheeler, personal communication, February 10, 2014). Dr. Wheeler and Debbie spent about 10 weeks in a neonatal intensive care unit (NICU) with their daughter Kara when she was born at 26 weeks gestation. Weighing only 1 pound 10 ounces, Kara's life was very fragile and Debbie was not allowed to hold her as much as she would have liked. The bonding process was further hindered by Debbie's critical health condition after birth. Debbie required several weeks of respiratory intensive care after her delivery with a condition called granulomatosis with polyangitis. However, Dr. Wheeler emphasized several interventions the nursing staff implemented which allowed bonding to take place. Kangaroo care between Debbie and Kara was not allowed because Debbie was in the respiratory intensive care unit and had a chest tube in. However, Debbie was allowed to hold Kara's hand when Kara was three days old which was a very special moment of bonding for both of them. This was a time where Debbie felt a strong connection with her newborn, and it also alleviated some of the stress they were feeling while having a daughter in intensive care. Dr. Wheeler also pointed out ways to promote bonding that do not involve physical touch. When parents experience an unexpected premature birth, there are often numerous questions they will have, and their confidence in parenting skills is likely to be low. However, nurses and doctors can promote bonding by educating the

family about every procedure being done to the newborn. For example, when Dr. Wheeler went to visit Kara in the NICU, he found the IV in Kara's scalp vein to be frightening initially. However, the nurses explained the purpose of the IV and ensured him it was not causing her any additional pain. Kara later developed an infection, and the nurses were honest but encouraging about her condition. The staff explained how it was very common for newborns of her age to develop this and they expected her to return to a state of health with the antibiotics. The Wheelers said having the staff explain Kara's condition was very comforting and helped them bond with Kara. Part of the stress a newborn feels while in a newborn nursery comes from the stress the parents are feeling. Therefore, by reducing the amount of stress felt by the parents, the bonding process can be strengthened.

Being separated from Kara was very hard for Debbie (Debbie Wheeler, personal communication, February 23, 2015). She wanted to be able to be in the NICU holding her newborn, but her condition was not stable enough to allow it. The hospital staff recognized Debbie's desire to bond with her newborn and did everything they could to enhance their relationship. They took pictures of Kara frequently and would bring them to Debbie in the ICU so she could see updates of her newborn. Debbie explained that the first time she saw pictures of Kara, she cried because she thought Kara was in pain. However, the nurses assured her she was not. Debbie had a tracheostomy tube that prevented her from being able to speak. However, she was able to write questions for the nurses and doctors to respond to. The NICU staff also accepted pictures of the Wheeler family to post around Kara's isolette so when members of the Wheeler family would come to visit, the NICU staff could recognize them and introduce them to Kara. This

promotion of therapeutic communication played a key role in the bonding between Kara and Debbie.

The Wheelers emphasized engaging the entire family in the bonding process is important when the health of the mother prevents her from being able to be with her newborn as much as desired (David Wheeler, personal communication, February 23, 2015). Keeping the family and parents engaged was a great contribution to the bonding process. When Dr. Wheeler described the NICU, he mentioned how there were very few fathers there. He emphasized through difficult situations, it is important to involve the family in the bonding process to build a support system.

Another action the hospital staff did to promote bonding during the Wheeler's NICU experience is they provided the Wheelers with a list of other parents who had children in the NICU (David Wheeler, personal communication, February 10, 2014).. This provided a network of encouragement for the family as they could hear testimonies from other families who had children in the NICU in the past. These families were able to offer encouragement for Debbie and Dr. Wheeler which helped them strategize ways to bond with Kara. Therefore, when opportunities for physical touch are limited, maternal newborn bonding can still take place

Nurses who are caring for couplets with the newborn in the NICU should consider ways to unite the mother with her newborn as soon as possible (Davidson et al., 2012). If the mother's health prevents her from taking a trip to the NICU, the nurse can offer to take pictures and/or video clips of the newborn and show them to the mother in order to reassure her of the newborn's status. This combination of education, support, and creativity can be used to promote a bonding experience as optimal as possible for both

mother and newborn. Postpartum nurses should be aware of any potential barriers to bonding and be ready to assess for signs of impaired maternal-newborn attachment. Some signs the nurses should look for include a lack of verbal communication with the newborn, a hesitant response to the newborn when he or she cries, an apparent distress over the newborn's gender or congenital abnormality. If any of these signs are seen, the nurse can intervene with reassurance, patient education, or role modeling care in order to promote bonding. However, the nurse should keep in mind individual characteristics such as values, beliefs, and cultural customs may impact the bonding process.

Recommendations

Several recommendations can be made for hospitals wanting to increase maternal-newborn bonding during the postpartum period (Phillips, 2013). The first recommendation is to modify hospital protocols so they support uninterrupted skin-to-skin contact immediately after birth for both vaginal and cesarean birth, unless the newborn or mother is medically unstable. Hospital protocols should allow for tasks such as medication administration, assessments, and newborn weights to be delayed until at least after the first postpartum hour. Even minimally invasive procedures such as glucose testing can be done to asymptomatic newborns while on the mother's chest. If the mother is weak from a strenuous labor or is on any type of medication that causes an alteration in consciousness, nurses should make certain somebody is available to support the mom during this skin-to-skin contact to ensure safety.

The Women's Place at the University of Virginia has recently implemented a change in their protocols that involve this uninterrupted skin-to-skin after birth (M. Fitzgerald, personal communication, January 28, 2015). The unit has educational signs

posted with titles such as “My weight can wait” that advocate for this process. Patients are provided with informational brochures regarding the benefits of skin-to-skin. As a part of the admission process, mothers are informed about what the first postpartum hour will look like including skin-to-skin for one hour and the initiation of breastfeeding. The nurses’ lounge also has educational posters for the nurses to aid in the encouragement of these baby-friendly measures. Some nurses eagerly encourage their patients to participate in these procedures whereas others are more skeptical about them, but over time the acceptance has grown. Obstetric units can adopt similar techniques that result in healthy newborns and mothers participation in skin-to-skin care. Many baby-friendly hospitals, such as Virginia Baptist Hospital, are proposing a practice change to incorporate routine skin-to-skin contact into the maternal-newborn protocols after a cesarean birth (T. Turner, personal communication, March 8, 2015).

Numerous national and international pediatric and women’s health organizations, including the American Academy of Pediatrics, the National Association of Neonatal Nursing, the Academy of Breastfeeding Medicine, and the World Health Organization endorse skin-to-skin care as an important postpartum intervention regardless of the method of delivery (Stone, Prater, & Spencer, 2014). Many hospitals do not promote skin-to-skin contact after cesarean sections because it can be inefficient and difficult to manage. However, when a mother and newborn are separated after a cesarean, the couplet is more likely to experience delayed breastfeeding, decreased maternal satisfaction, and decreased chance for neurobehavioral and physiological benefits for women and newborns. Therefore, there are several practical suggestions that can be made to ensure the procedure of skin-to-skin contact goes as smoothly as possible after a

non-emergent, full-term cesarean surgical birth among low-risk healthy women. The implementation of skin-to-skin care in the operating room can be carried out using the Lewin's Model of Change. The Lewin's Model of Change involves three stages: Unfreezing, moving, and refreezing. Unfreezing involves inspiring and motivating the hospital staff for this change. In this situation, a project manager can be used to present evidence-based information regarding the known benefits of SSC after a vaginal birth to develop a desire to continue that benefit in the operating room (OR). The motivation of gaining Baby-Friendly Hospital designation and/or financial reimbursement can also be used to encourage staff to promote SSC. The second stage involves combating resistance to change and carrying out implementation by gaining support of obstetricians, neonatologists, and anesthesiologists. The final stage involves reinforcing the change so that sustainability is promoted and SSC after low-risk cesareans becomes routine.

Before the birth, it is important for the nurse to introduce herself to the mother and confirm she would like to hold her newborn skin-to-skin for the first hour after birth (Phillips, 2013). This is a great time for patient education about its benefits and importance as well. Once the nurse knows who the obstetrician and anesthesiologist will be, she can verify there are no currently anticipated concerns for the newborn or the mother's medical stability. If a cesarean section is needed, the nurse can release the mother's arm from the arm board so she can touch, cuddle, and comfort her newborn as long as the anesthesiologist approves. After the surgery is completed, the mother and newborn can be transferred to the recovery room while the newborn is nestled securely between the mother's breasts and supported by the nurse's hands if needed. Furthermore, nurses can ensure the mother's gown is unsnapped so it can be easily lowered to place the

newborn on her bare chest in a transverse position with the newborn's head on one breast and the abdomen on the other breast. The greater the surface area of the skin from both mother and newborn allowed to touch, the greater the benefits will be. One way this skin contact can be optimized is by cutting and clamping the umbilical cord so it is 8-10 inches long. This prevents the clamp from being directly between the newborn and mother, which prevents the newborn from lifting away from the hard plastic umbilical camp that can be a source of discomfort for the newborn. The umbilical cord can later be re-clamped and trimmed during the newborn's first bath. It is also appropriate to have a diaper as well as warmed blankets ready to dry and cover the newborn while on the mother's chest after birth. When SSC is implemented in the OR, the American Association of Operating Room Nursing requires there to be a nurse solely responsible for monitoring the newborn in order to ensure safety of both patients (Stone et al., 2014).

Conclusion

In conclusion, it can be seen maternal-newborn bonding in the early postpartum period has a plethora of physiological, emotional, and psychological benefits for both mother and newborn. All caregivers involved in the childbirth process can support the bonding process by providing education and support during the postpartum period that will encourage participation in skin-to-skin contact, early breastfeeding, eye contact, and newborn massage. Nurses have a responsibility and obligation to advocate for what is best for both mother and newborn, and the priority should always be placed on the patient rather than on convenience of the staff. Nurses have the power to promote clinical practices that will support optimal maternal-newborn bonding in the postpartum period. When a positive bonding experience is created in the labor and delivery room or in the

operating room, it supports the importance of an environment in healthcare today that encourages a positive attachment for the newborn and parent.

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