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Call for Papers

Clinical Lactation is a peer-reviewed journal summarizing recent advances in clinical care in the field of human lactation, and is the official journal of the United States Lactation Consultant Association. The aim of the journal is to advance clinical practice for lactation specialists who work in a variety of settings: hospital, private practice, WIC, and mother-to-mother-support organizations. The articles being solicited for Clinical Lactation are concise, readable reports that summarize issues related to clinical care, treatment innovations and applications. All articles should contain specific implications and suggestions for clinical practice. Suitables topics for submission include, but are not restricted to:

- Treatment innovation
- Treatment dilemmas
- Case presentations
- Implementation of specific programs
- Outcomes of policies or programs

Papers should be consistent with the current evidence base (if applicable), and should constitute a substantive contribution to the professional literature on clinical lactation. All articles can be hyperlinked to videos, websites, PowerPoint slides, or other ancillary sources of information.

Types of Contributions

Articles on Clinical Practice. These articles include process and program descriptions, clinical audit and outcome studies, and the presentation and description of original clinical practice ideas. These articles should generally not exceed 1,500 words (approximately 6 pages of double-spaced text), including references, and should be written in a readable, user-friendly style.

Brief Reports of Research Findings. Brief reports of research findings are concise reports of new research. These articles are limited to 2,000 words including references and must have direct clinical relevance. These reports can be hyperlinked to other documents or websites with additional information.

Brief Literature Reviews. Brief literature reviews are concise articles on a highly specific topic related to clinical practice, ending with applications for practice. These manuscripts are also limited to 1,500 words (6 pages of double-spaced text).

Case Reports. Case reports offer clinicians a forum to share an interesting case, with the implications for broader clinical practice. These reports will typically range from 3–5 manuscript pages (750–1250 words).

Letters to the Editor. Letters and responses pertaining to articles published in Clinical Lactation or on issues relevant to the field, brief and to the point, should be prepared in the same style as other manuscripts (250–300 words).

Submission Requirements. All manuscripts submitted should adhere to the format delineated in the Publication Manual of the American Psychological Association, 5th Edition. Go to ClinicalLactation.org for submission instructions. Please also contact the editor if you have questions about a possible submission (kkendallt@aol.com).
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Mission: To build and sustain a national association that advocates for lactation professionals.

Vision: IBCLCs are valued recognized members of the health care team.

The United States Lactation Consultant Association (USLCA) is organized for the advocacy of the International Board Certified Lactation Consultant.

- Advocate for USLCA members and advise relevant authorities on issues of concern to USLCA members.
- Uphold high standards of professional practice.
- Promote appropriate credentialing for lactation professionals in the United States of America.
- Foster communication, networking and mutual support amongst USLCA members.
- Provide for or facilitate education opportunities for International Board Certified Lactation Consultants (IBCLC) and other health care workers concerned with breastfeeding and related issues.
- Cooperate with other organizations whose aims and objectives, in whole or in part, are similar to those of USLCA.
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- Heighten recognition of the consequences of artificial feeding of infants and children.
- Foster awareness of breastfeeding and human milk feeding as important measures for health promotion and disease prevention.
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If you are interested in joining USLCA or learning more, go to USLCA.org.
In *The Structure of Scientific Revolutions*, Thomas Kuhn describes how scientific revolutions occur. Kuhn argues that the history of science is not a straightforward accumulation of facts. Rather, science is a road with many twists and turns.

Scientific revolutions happen when there is a change in the dominant paradigm—a phenomenon he called “the paradigm shift.” The work of normal science is to seek and create a model that will account for as many observations as possible within a coherent framework. Change starts when scientists observe anomalies—things that do not fit within the prevailing paradigm. As these anomalies accumulate, some will be labeled as errors, some will make small changes to the existing paradigm, and some will lead to revolution.

Revolution often begins with bold individuals who challenge long–held assumptions. These bold ones may develop a rival framework that the establishment initially rejects because, being a new theory, it will have many conceptual holes. But others may be intrigued by the new theory and work to develop it. For awhile, the two paradigms may exist side–by–side. As the new paradigm matures and becomes more unified, it may eventually replace the old paradigm. In short, shift happens.

A paradigm shift is actually a change in world view. The new paradigm does not just extend the old. Rather, it changes the way terminology is defined, how scientists view the subject, and what questions are regarded as valid. All of the textbooks have to be rewritten after a paradigm shift. Scientists will seek to encompass and explain all unexplained phenomenon within the new framework.

Kuhn’s theory is quite relevant to our work as lactation consultants. This theory is especially relevant for clinicians because paradigm shifts often start in the field—not the lab. This happens when astute clinicians notice something that cannot be accounted for by the prevailing paradigm. It may be several years until this initial observation develops into a coherent alternative theory. But we should never discount the importance of those “ah–ha” moments in the development of a scientific paradigm—which is why clinical work is so important to this process.

The above discussion also provides context for understanding the term “evidence based.” Some people I’ve spoken with think that evidence–based means, basically, tacking references on the back of an article. Does doing that make an article evidence–based? References are certainly good, but what if it’s an idea that is outside the prevailing paradigm? There may not be any references. Does this mean we uncritically accept all new ideas? No. But should we shut ourselves off from all new ideas? Also no. For if we fail to consider new ways of doing things, we will cease to grow as a field. We need to recognize that an interesting idea or conjecture, even with no references, can lead to a whole new line of evidence and is an important part of the overall process of developing an evidence base.

So with that in mind, I present four new articles (all with references) in our first issue of *Clinical Lactation*. I hope these articles will start some interesting discussions and help us think through some of our assumptions. I believe we are on the precipice of a major paradigm shift in the lactation field. Will this shifting paradigm follow some neat linear path? Probably not. But it will be exciting to be a part of it. In the meantime, I hope these articles will give you some tools to help you in your work.

Thanks for all you do for mothers and babies. And please let me know what you think. You can reach me via our *Clinical Lactation* Facebook page, or you can email me directly.

Kathleen Kendall–Tackett, Ph.D., IBCLC, FAPA
Editor–in–Chief
Department of Pediatrics
Texas Tech University School of Medicine
Amarillo, Texas
kkendallt@aol.com

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Human neonates are born with an innate ability to find the breast, latch and feed. Unfortunately, some of these very reflexes can also hinder babies’ efforts to breastfeed depending on the mother’s posture. This article provides a brief overview on the mechanisms of biological nurturing (BN) and describes how practitioners can help mothers trigger innate feeding mechanisms so that they do not become barriers to breastfeeding.

**Keywords:** biological nurturing, primitive neonatal reflexes, mother’s posture

From a survival standpoint, it makes evolutionary sense that neonates be born with a number of simple, innate movements enabling them to find the food source, latch on and feed. With the 20th century rise of bottle-feeding, however, we lost that sense of babies’ ability to find the breast. More concerning are subtle ways bottle feeding norms still influence advice breastfeeding mothers receive. The current mainstream approach is that mothers need to sit upright to latch their babies (UNICEF UK et al., 2008). Inherent in this approach is that mothers must counteract gravity by applying pressure along the baby’s back.

Indeed, our findings suggest that when mothers sit upright, or even when they lie on their sides, gravity pulls the baby away from the mother’s body. To counteract gravitational forces, mothers hold their babies close; these holds often suppress, limit, or even waste innate baby feeding reflexes. In fact, these same reflexes may actually become barriers (rather than aides) to latch and sustained milk transfer (Colson et al., 2008). It is as if the position the mother sits in could transform breastfeeding from a method reliant upon skills into a relationship.

In BN, mothers neither sit bolt upright nor do they lie on their sides or backs. Instead, at the start of a feed, they lean back in semi-reclined postures, usually placing the baby on top of their bodies, so the entire frontal aspect of the baby’s body is facing, touching, and closely applied to their body curves or to a part of the environment (Colson, 2005a, 2005b; Colson et al., 2008). The movement is in the pelvis and an understanding of pelvic anatomy underpins using BN. We formulated scientific definitions for the mother’s feeding position based upon bony pelvic reliance and amount of back support.

The Role of the Bony Pelvis

Kapandji (1974), a French orthopedic surgeon, integrated and illustrated complex physiology and mechanical functioning of joints and muscles within the anatomical context. His explanations and illustrations, together with those from recent English midwifery textbooks, provide the basis for understanding the difference between upright and laid-back sitting postures.

An unexpected finding from this study was that mother’s posture influenced the role that the PNRs played. As soon as mothers lie back, they look comfortable, relaxed and focused upon their babies—often smiling, giggling and oblivious to the world. The baby finds the breast using his inborn reflexes that now look smooth and purposeful. Because the strength of reaction is somewhat blunted by gravity, the baby reflexes appear to aid neonatal locomotion leading to latching behaviors, self attachment and good milk transfer (Colson et al., 2008).

**Keywords:** biological nurturing, primitive neonatal reflexes, mother’s posture

To Learn More About PNRs

- [Stanford School of Medicine, Neuro/Reflexes](#)
- [Primitive Reflexes](#)
Pelvic sitting support

When sitting upright or leaning slightly forward, the body mass is supported evenly by the two ischial tuberosities. In ischial sitting postures, for example, those used to drive a car, ride a bike or to work at the computer, the weight of the trunk sits firmly upon a solid base, either a chair, or a seat (Kapandji, 1974). Body weight is placed equally on both ischial tuberosities; the thighs are parallel to the floor and ideally, the seat height permits the feet to rest flat on the floor. The body leans forward from the hips when necessary but does not curve at shoulders or neck. Kapandji (1974, p. 112) calls this the “typist position,” characterizing it as fraught with potential for muscular fatigue and the most difficult body posture to sustain.

In contrast, when sitting laid–back, for example, sprawled on a chair or sofa while watching television, the back of the chair or sofa always supports the trunk. Bony pelvic reliance comprises the posterior surface of the sacrum and the coccyx with limited ischial support. Kapandji (1974, p. 112) terms this posture the “position of relaxation.” It is an in–between posture neither sitting bolt upright nor flat–lying. Kapandji states that this position can be achieved with the help of cushions or specially designed chairs, but our results show that mothers do not need any equipment to sit in this position. Figure 1 summarizes these differences comparing an adaptation of Kapandji’s “typist’s position” with his “position of relaxation.”

Maternal comfort mechanisms

All mothers experience a wide range of challenges to their personal comfort right after birth. The abrupt change in body shape can be a real shock and sometimes body parts feel sensitive, ache or are sore. This can be compounded by abdominal pain if the mother has had a caesarean birth or perineal pain if she has had an episiotomy or an operative or assisted delivery. A mother may also have pain from sore nipples or engorgement, and some also complain of neck tension and shoulder pain. This may be because it is difficult to maintain the upright position for long periods of time (Kapandji, 1974).

Laid–back breastfeeding, by definition, means that every part of the mother’s body—importantly, her head, neck, shoulders, upper and lower back are relaxed. Mothers often say that as soon as they sit back, the shoulder and neck tension melt away. Nipple pain is often alleviated immediately and this may happen because gravity is not dragging the baby down the upright maternal midriff. Mothers also have increased freedom of movement as one or both hands are free; their bodies hold the baby not their arms. Figure 3 compares maternal body support in upright postures with BN postures. [see a video].

Does this mean that mothers should never initiate breastfeeding in upright postures? From a practical standpoint, no. Human mothers and babies are extremely versatile, able to breastfeed in many different
positions, and it would not be helpful to prescribe laid-back postures as the only way to initiate breastfeeding. Millions of mothers have obviously been able to breastfeed while sitting up. But there are some limitations to that approach. In our study, observations for the first episode demonstrated that 12 of the 27 breastfeeding mothers who sat upright latched their baby successfully onto the breast with good milk transfer. However, only a quarter of them (N=3) were pain-free; the other nine mothers modified their baby's positions, their own postures, or both in subsequent episodes to achieve an increase in comfort.

In contrast, the laid-back BN posture immediately changed things. It opened the mother's body which gave the baby more space to maneuver. Importantly, mothers' bodies were fully supported and they often had both hands free because they no longer needed to hold the baby applying pressure along the baby's back, head or neck; gravity helped keep the baby on the mother's body. In addition, when mothers initiate breastfeeding while sitting upright, they may be faced with more direct instruction and intervention than when they are left alone to quietly discover each other, as this mother describes.

Dear Suzanne,

My son was placed to my breast shortly after the birth and fed for about 35 minutes, and it was fabulous. The midwife was very relaxed and simply placed him there and let him do his own thing, while I laid back and relaxed! I decided there and then that breastfeeding was definitely for me, but was very apprehensive as I had heard so many negative things regarding it, and I did not know anyone who had been successful for any length of time. I am certain that if my midwife had not been so natural and chilled out about this first feed, things would have been very different. I was moved to the postnatal ward a few hours after the birth. It was horrendous. Nurses standing guard and scrutinizing every move I made breast-wise! It was here that I heard the mantra “tummy to mummy, nipple to nose” spoken aloud. I had read about it before the birth but didn’t realize it was almost treated as the law! I hate those words now; I found myself repeating them in my head and didn’t dare deviate. I was also told to sit bolt upright ... I was intimidated to say the least when a line up of 3 nurses stood in front of me watching me trying to force my baby to latch on. They said I couldn’t go home until I could manage to feed him ok, but I so wanted to be out of there. I tried to let him find his way to the nipple and was immediately berated for it! Now you can see why I would have appreciated simply being told that there are alternative ways to breastfeed! The hospital staff was obsessed with breastfeeding without seeming to offer any practical advice except for the instructions printed in the government leaflets. I have learned now that, as a mother, your instincts CAN be trusted and that your baby is well equipped to feed himself given half a chance. I just needed someone to tell me this at the time! Thanks again [for explaining BN which] has given me so much reassurance and a lot more confidence about things. I hope I can pass this on to any new mums I come into contact with through my peer supporting role in the future.

Is BN Species-Specific?: Directions for Future Research

This initial research on the mechanisms of BN raises some interesting questions, such as could BN postures and positions be species specific? Human infants develop as quadrupeds; locomotion is first achieved through crawling. The human baby struggles to a semi-upright sitting posture from four to seven months of age, beginning to toddle erect when they are about a year old. Taken together these facts suggest a strong developmental argument: Our babies, like some of our quadruped mammalian cousins, would biologically commence life as abdominal or what I call frontal feeders. The human baby struggles against gravity is progressive suggesting that phylogenetically, our babies would be semi-upright to feed, supported by a gentle maternal body slope. If being human involves retracing our phylogenetic history, as Peiper (1963) suggests, then during the first year of life, BN laid-back maternal postures enabling full neonatal frontal feeding positions may be a species-specific positional choice, aiding breastfeeding initiation.
Conclusions
The results of our research have had an amazing impact upon my practice. If you are interested in applying BN in your practice, below are some guidelines that will help you do so. Please write and tell me about your experiences. [click here]

Clinical Applications I: Using BN to support a mother getting started with breastfeeding.
You may want to:

1. Explain that for her, a BN posture is one where her back touches and is supported by the back of the chair or sofa; her own comfort is the priority. Tell her there is not one “correct” breastfeeding position and she might like to try feeding her baby in the same positions she uses to watch television.

2. Explain that her body supports the baby, not her arms or pillows. However, pillows can sometimes help to support her own arms, upper back, head and or shoulders.

3. Share that mothers often sacrifice their own personal comfort for a good latch. This may increase fatigue and should be avoided. Tell her that an important part of your role is to check that every part of her body is supported.

4. Help her place the baby on top of her body in a position where every aspect of the baby’s body can brush up against one of her body curves or a part of the environment, such as a blanket, bed clothes, or the bed or chair. This is particularly important for the baby’s thighs, feet tops and soles.

5. Share that a baby often uses inborn reflexes to move into a position similar to the way he was lying in the womb. This point of continuity may be comforting to both mother and baby.

Clinical Applications II: Problems such as latch refusal, sore nipples & breast fullness.
You may want to:

1. Suggest that she does BN when the baby is in sleep states. This entails picking up the sleeping baby without waking him and laying him on top of mother’s body in BN postures/position. We have not looked at the effects of behavioral state in this paper. However, it is well known that reflex actions can be released in sleep states and an entire chapter is devoted to this important subject in Colson (2010).

2. Use BN as a test for tongue tie before you separate baby and mother to make a physical assessment of the baby’s mouth. Gravity always brings the tongue and chin forward during BN.

General Observations. Be aware that BN:

1. Is not a maternal flat–lying posture and the reasons for this are discussed in detail in Colson (2010).

2. Is usually carried out when mothers and babies are lightly dressed except for the first hours following birth.

3. Maternal postures open up a wide variety of baby positions. Like the hands of a clock, the baby can approach the breast from any angle. This means that the baby does not always lead in with the chin. Rather the entire trigeminal facial area may bob against the mother’s breast. Attachment is not always asymmetrical.

4. Baby positions promote self attachment but not always. Sometimes the mother needs to help. During self–attachment, the baby’s body is not always in a straight line.

5. Attachment can initially look like nipple sucking and as long as there is good milk transfer and there is no pain, this more superficial BN attachment works well.

References


Infant ability to find and attach to the breast has only been recently appreciated. When mothers are in reclined, laid–back or biological nurturing positions, the mothers’ bodies provide optimal support for their infants, which releases infant instinctive feeding behaviors. One type of instinctive behavior that infants reveal is their deliberate use of their hands to locate, move and shape the nipple area. In this article, we provide photographic evidence of several infant hand–use strategies, as well as information on how professionals and mothers can elicit, support and modify these behaviors when needed.

Keywords: breastfeeding, laid–back breastfeeding, infant hand, infant feeding behaviors

Mothers are often taught to hold their babies’ hands when latching them on to avoid them “getting in the way.” Historically, infant movements were thought to be random and purposeless. This may be because infants are often studied in solitary conditions, separated from their mothers. Infants studied at their mother’s breast produce predictable movements (Prechtl, 1958), but it is difficult to prove that infants’ movements are intentional. Lew and Butterworth (1995, p. 456) found that infants fed sugar solution bring their hands to the breast; but in the absence of the breast, this posture is likely to result in hand–mouth contacts.

When researchers photographed and videotaped infants, they were able to analyze movements that occur closely in time. Butterworth and Hopkins (1988) stated that infant hand–to–mouth movements seem to be deliberate but not well coordinated.

The hand–mouth coordination has all the characteristics of a goal–directed act which only occasionally fulfils its intended outcome because it is unskilled. The fact that the mouth opens before the arm moves suggests that the mouth actually anticipates the arrival of the hand rather than simply acting as the passive terminus for the movement. (p. 311)

Butterworth hypothesized that infants used hand–to–mouth movements to regulate their state and to self–calm (p. 313), but not as part of the sucking reflex, as he saw little finger sucking in his films of newborns.

These behaviors also appear in utero. Researchers used ultrasound to study the development of motor skills in fetuses of various gestational ages. Miller et al. (2003) noted that the fetus almost invariably touched the face or mouth before swallowing amniotic fluid. Sparling et al. (1999) noted that movements of 21 low–risk (healthy) fetuses appeared non–random, and changed from month to month. Duration of hand–to–mouth movements were greatest at 20 weeks gestation, and then increased again after birth. This decrease, then reappearance is “consistent with developmental curves where a movement disappears to reappear in a more advanced pattern.”(p.35)

Van der Meer et al. (1995) demonstrated that infants use vision to guide antigravity hand movements. The infant subjects lifted their weighted hands only when they could see them, either directly or on a video monitor. Bringing infants to the breast with their hands hugging the breast keeps the hands in the peripheral vision. Figure 1a shows an infant in this position, looking intently at the breast.

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**Figure 1a.** Baby looking intently at his hands hugging breast.
before attaching (1b). Having the hands in this position also helps stabilize the neck and shoulder girdle by adducting (pulling together) the shoulder blades. Hand movements are also stronger when the arms are raised rather than held at the infant’s sides (Prechtl, 1958).

Mother–infant skin–to–skin contact influenced maternal oxytocin levels in another study (Mathieson et al., 2001). Newborns in this study invariably oriented to the breast and used massage–like hand movements on the mother’s breast and nipple area, which both caused increased maternal oxytocin levels and caused the nipple areolar area to become erect and more prominent to facilitate latch. Ransjo–Arvedson et al. (2001) found differences in newborn feeding behaviors in those exposed to labor analgesia, including IV pethidine (meperidine) and/or epidural bupivacaine. Only 40% of drug–exposed infants attached to the breast, and all of those who latched massaged their mother’s breast significantly longer than infants born to unmedicated mothers.

A classic study demonstrated that touch to different parts of the infant’s face stimulated specific movement patterns (Prechtl, 1958). When infants were touched on the corner of their mouth and cheek, they started side–to–side scanning or rooting movements, which Prechtl called the pendulous orientating response. The newborns rubbed their faces on the stimulus from one corner of their mouth to the other corner of their mouth. Infants use scanning to search the mother’s chest for her breast. This particular response was interesting because it was the only one Prechtl identified that did not accommodate over repetition. Other reflex responses become inhibited in the brain over repeated stimuli, whereas alternating repetitive stimuli to the corners of the mouth provoked repeated side–to–side head movement. This behavior continued until the perioral area came into contact with the nipple, when the baby would gape, search with the tongue for the nipple, and pull the nipple into the mouth. The researchers most efficiently stimulated gape (mouth opening) at the philtrum, the area between the upper lip and nose. In contrast, when only the lower lip was stimulated, babies flexed their heads and moved their lower lips downward.

Mathieson et al. (2001) found that newborns used their hands as well as their lips and tongue to draw the nipple into their mouths, a response which persists in infants until about 3–4 months of age, and can be used to help infants learn to breastfeed (Smillie, 2008). Paul, Papousek, and colleagues (1996) studied feeding behaviors of infants monthly from 2 weeks to 26 weeks, and found that pre–feeding motor movements decreased between 18 and 26 weeks of age. After studying 20 infants over 6 months, they concluded that infants demonstrated a “finely organized behavioral pattern.” (Paul et al., 1996, p. 572)

The position the mother is in can obstruct or facilitate infant movements. Colson et al. (2008) demonstrated that infant and maternal feeding–related reflexes were facilitated by the mother being in a semi–reclined position, allowing the baby to be on its abdomen. Anti–gravity movements, such as scanning and head righting, were identified as particularly important in finding and attaching to the breast. Maternal semi–reclining positions are also more ergonomic for the mother, freeing her arms from the need to hold the baby’s weight to her body against the pull of gravity. Further information on this technique can be found at http://biologicalnurturing.com.

We’ve observed that semi–reclining improves access to the nipple as the breast lifts off the postpartum belly. In the laid–back position, gravity supports the baby’s weight on the mother’s abdomen or chest, providing the vital stability that allows for better motoric function. This allows the infants muscles to work in feeding rather than attempting to stabilize their body position. Furthermore, if the infant attempts to latch when his body is sidelying and misses, gravity pulls him away from the breast, whereas if the infant misses the breast while prone, gravity pulls him toward the breast.

**How Infants Use their Hands at the Breast**

It is well recognized that infants put their hands to the breast. But it is less well known whether their hand...
movements are intentional. Almost all breastfeeding instructions include restraining the baby’s arms. However, we’ve observed that if left unhindered, infants from birth to at least 3–4 months of age use their hands during the attachment process. How the infant uses the hands and arms depends partly on the orientation of the infant’s face to the breast. If the face is touching the breast, infants may use their hands to push or pull the breast to make the nipple accessible to the mouth, or to shape a better–defined teat. If the face is not touching the breast, infants may use their arms to push away, perhaps to get a look at the nipple location, or may search with the hands for the nipple and close on it or just below it. Once the hand finds the nipple, the baby mouths the hand, calms, and then often moves the hand away and latches on to the same spot.

The following examples have been captured in photographs and videos. Figure 2a shows the infant resisting the mother’s attempt to push the breast toward his mouth. Once he is attached, (Figure 2b) he relaxes his hand. The infant in Figure 3 (a and b) is tongue–tied and cannot extend the tongue enough to grasp the breast well, so she uses her hands to pull the breast into her mouth.

On video clip a, a one–month–old baby who has been latching shallowly (to only the nipple) with “traditional” latch techniques, is given more autonomy at the breast. She brings her hand to the areola, sucks her hand, comes away from the breast for perhaps a better look or to re–adjust her position, then comes back to the breast. The author (CWG) helps the mother bring the baby closer to help her attach more deeply. In video b the same baby moves the hand away and latches, when brought closer.
close enough that she feels the breast with her face. In figure 4a and 4b (video c), a 14-day-old infant shapes the breast with his hand, using the technique illustrated in Rebecca Glover’s video Follow me Mum!

**How to Facilitate Skillful Infant Hand Use**

Start with a semi-reclined, comfortable maternal position with the infant snuggled close to mom so that the baby’s body is completely supported as in Figure 5.

Bringing the infant’s arms around to “hug” the breast allows them to stay in the line of sight, which improves motor strength and precision. Avoid restricting the baby’s use of their hands by swaddling, holding the arms, or trapping them in the mother’s cleavage. If a laid-back breastfeeding position is not possible, using a cradle hold and snuggling the baby’s belly very close to mom’s body helps the infant access and use his hands.

Many infants respond with mouth gape, tongue protrusion, and latch when placed with their chin or face to the breast. Placing the baby’s body so the chin is snuggled in to the areola and the philtrum touches the nipple elicits the widest gape response, consistent with Prechtl’s findings (1958). Figures 6a and b illustrates the infant response to this appropriate stimulus.

Some infants respond better to positioning with their cheek on the breast just above the areola so they can root or scan down to the nipple as in Figure 7.

Other infants need to begin their behavioral feeding sequence from “start” and find the breast independently.
Starting with the infant at mom’s chest or shoulder (Figure 8a) and allowing him to scan with his cheeks as in Figure 8b often results in the baby moving to the breast and self-attaching.

When self-attaching, infants will position their own hands and arms to help identify, move, and shape the nipple area. Mothers are easily convinced that their infants are competent and are using their hands deliberately. Mothers can then be patient and allow their babies time to figure out the best way to attach. If the infant uses tactile searching with the hand to augment oral searching (perhaps because the tongue is slightly restricted and retracts when the mouth opens wide, as in Figure 6b) (note the normal tongue position during latch in Figure 1b), they will usually mouth the hand once it lands on or below the nipple (Figure 9). Educating the mother that this is a normal step in the sequence and that the baby will move the hand and then re-attempt latching prevents her from interfering with the self-calming and orienting that hand sucking at the nipple provides. Allowing the infant to self-calm helps keep the mother calm and allows her to continue to be patient with her baby as well. If the baby misses the attachment at the next attempt, try encouraging the mother to snuggle her baby’s body in more closely so his cheek or chin touches the breast.

If a mother has sore or damaged nipples, you may want to help the mother limit tactile searching, as the baby’s grasp response will lead him to pinch or squeeze the nipple with the hand. This can cause pain in damaged nipples. Making sure that the baby’s face touches the breast at all times will increase oral searching and decrease tactile searching if the mother is sore.
Mothers who used pain medication in labor may need to be more patient and proactive. Infants exposed to labor analgesia massage the breast for longer before attaching, and are far less likely to suckle after birth. Staff is often concerned about infant blood glucose levels or excessive weight loss. Keeping the baby skin to skin with the mother avoids stress-induced rapid utilization of glycogen stores, which reduces the risk of infant hypoglycemia (Christensson et al., 1992; Mazurek et al., 1999). Mothers can be taught to express colostrum onto the nipple for their infant to lick, or into a spoon or small cup for immediate feeding. Babies often latch if returned to the breast right after spoon or cup feeding. These strategies stimulate milk production and provide the infant with calories while he clears the drugs and regains a more normal neurobehavioral status.

**Conclusions**

Infants actively participate in finding and attaching to the breast. Their participation includes deliberate, but unpracticed, use of their hands to locate, move and shape the teat. Maternal and professional understanding of these strategies and how to work with them may reduce infant and maternal frustration and improve breastfeeding outcomes.

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Infants who are late preterm (34–36 weeks) may appear mature, but they are physiologically, metabolically and neurologically immature. Late preterm infants are at higher risk for a number of problems including poor feeding, jaundice, hospital re-admittance and potential breastfeeding failure. This article provides specific strategies for working with late preterm infants and avoiding these negative health outcomes.

Keywords: Late preterm, breastfeeding difficulties, jaundice, dehydration

Introduction

Sara was born at 35 weeks weighing 6 pounds 6 ounces. Her mother Anna was told that Sara was considered “full term” because of her weight and was even sent home early because she was so “big and healthy.” Sara had a good latch but tired quickly at the breast. Three days later Sara was readmitted for high bilirubin levels and weight loss. Anna’s milk supply was blamed and she was advised to start formula.

This unfortunate scenario is played out all too often but does not have to be the outcome for the breastfed late preterm infant.

The rate of premature births (<37 weeks) in the United States is 12.3% (Martin et al., 2010), with the largest portion of these being the late preterm infant (34–36 weeks). The 8.8% rate of late preterm births places over 450,000 infants at risk for respiratory distress, apnea, bradycardia, excessive sleepiness, weight loss, dehydration, feeding difficulties, weak sucking, jaundice, hypoglycemia, hypothermia, immature self regulation, sepsis, hospital readmission (Adamkin, 2006; Engle et al., 2007), prolonged formula supplementation, and breastfeeding failure.

Every Week is Important

Even though some late preterm infants may look like full-term infants and weigh between 4.5 and > 7 pounds, they are physiologically, metabolically, and neurologically immature, which is why they are often referred to as “little imposters.” While all of the organ systems have formed, the brain and respiratory system are among the last to mature. During the last 6 weeks of gestation, subcutaneous tissue and brown fat are laid down, glycogen stores increase in the liver, antibodies are passed to the fetus, and fetal muscle tone increases. Interruption in these processes helps explain the late preterm infant’s susceptibility to hypothermia, hypoglycemia, and sepsis. Low muscle tone affects the infant’s ability to generate vacuum at the breast (Kent et al., 2008).

An infant born at 34–35 weeks has 60% of the brain mass of a term infant. At 36 weeks the brain weight is about 80% the size of a full-term infant (Kinney, 2006). The immature brain stem negatively impacts upper airway and lung volume control, laryngeal reflexes, and the chemical control of breathing and sleep mechanisms. Interruption in brain development and myelinization helps explain the late preterm infants’ sleepiness, difficulty with state control, and uncoordinated sucking and breathing.

Human Milk as a Brain Builder

Human milk is extremely important to late preterm infants as it provides a rich source of components specially designed for brain growth:

- Increased brain ganglioside and glycoprotein sialic acid concentration in human milk–fed infants enhances developmental outcomes compared with formula–fed infants (Wang et al., 2003). Human milk oligosaccharides are an important source of sialic acid. Formula–fed infants receive only 20% of the sialic acid that a breastfed infant receives and are unable to synthesize the difference.
- Lactose (galactose+glucose) in breastmilk ensures an abundant supply of galactocerebrosides that are needed for myelination of the brain. Infants fed soy milk...
formula or lactose–free cow’s milk formula consume a diet lacking particular brain growth nutrients.

• Late preterm infants, just like early preterm infants (<34 weeks), are vulnerable to conditions associated with oxidative stress, such as necrotizing enterocolitis, and respiratory distress syndrome. Breastmilk has a much higher antioxidative capacity than infant formula and helps neutralize oxidative stress in young babies (Ezaki et al., 2008).

Meeting the Feeding Challenges of the Late Preterm Infant

Late preterm infants present a number of feeding challenges including fewer and shorter awake periods, sleepiness, they tire easily when feeding, have a weak suck and low tone, and may have an inability to sustain sucking, fatiguing easily before finishing a feeding. They are easily overstimulated and may shut down before consuming adequate amounts of milk. They may take small volumes of milk during the early days in the hospital, which may be sufficient for that period of time, but are unable to consume higher volumes of milk post discharge. Their tone may be adequate at the start of a feeding but rapidly decreases during the feeding, indicating decreased endurance. They may go through the motions of feeding, moving their jaw up and down, but low tone generally translates to poor vacuum, often resulting in little if any milk transfer.

Breastfeeding Interventions for the Inpatient Stay

The First Hour

If the infant and mother are clinically stable, the infant should be placed skin–to–skin on the mother’s chest and assisted to breastfeed within the first hour of birth.

Rationale: Late preterm infants show better cardiorespiratory stability with early skin–to–skin contact (Moore et al., 2007). A dose–response relationship exists between early skin–to–skin contact and exclusive breastfeeding, with longer contact times resulting in an increased likelihood of breastfeeding exclusivity in the hospital (Bramson et al., 2010). Early skin–to skin contact reduces the risk of hypothermia and lowers the risk of hypoglycemia by decreasing crying (Christensson et al., 1992) and increasing breastfeeding opportunities.

The First Day

The infant should be put to breast frequently:

• Within an hour of birth
• Once every hour for the next 3 to 4 hours
• Every 2–3 hours until 12 hours of age
• At least 8 times or more each 24 hours during the hospital stay

Rationale: This feeding plan is designed for preventing hypoglycemia or for infants in the hypoglycemic range (California Diabetes and Pregnancy Program, 2002).

Positioning

Infants should be positioned in a cross cradle, clutch, or ventral (prone) position to breastfeed, avoiding the cradle hold.

Rationale: Late preterm infants are prone to positional apnea due to airway obstruction, increasing the risk of apnea, bradycardia, and oxygen desaturation in positions that create excessive flexion in the neck and trunk. They lack postural control in their necks and may have difficulty maintaining stability during feedings. Semi–reclined maternal positioning with the infant placed prone may improve ventilation and stimulate feeding reflexes (Colson et al., 2008).

Breastfeeding interventions should aim to accomplish three goals:

• Prevent adverse outcomes,
• Establish the mother’s milk supply, and
• Assure adequate milk intake (Walker, 2008).

Breastfeeding care plans need to be created for the inpatient period, for discharge, and for any problems encountered or changes required once home (Walker, 2009). See Appendices A and B.
**Problems/Interventions**

**Difficulty or Failure to Latch**
Use of the Dancer hand position helps stabilize the jaw to keep the infant from slipping off the nipple or from biting or clenching the jaw (Danner & Cerutti, 1984). For infants who do not demonstrate spontaneous mouth opening or who do not open wide enough, the mother can gently exert downward pressure on the chin with her index finger as the infant approaches the breast (Figure 1).

Smacking sounds at the breast indicate loss of contact between the tongue and the nipple/areola. Sublingual pressure can be applied by the mother as she slips her index finger directly behind and under the tip of the chin where the tongue attaches, limiting the downward movement of the jaw.

Areolar edema may compromise latch. Use reverse pressure softening (Cotterman, 2004) or areolar compression (Miller & Riordan, 2004) to displace fluid away from the nipple and expose the nipple for an easier latch.

![Figure 1. Mother can exert gentle downward pressure on the chin.](image)

Flat nipples can be everted with a modified syringe (Kesaree et al., 1993) or commercial device designed to evert flat nipples.

**Latch Incentives**
For infants unable to latch independently, latch may be assisted with a milk-filled dropper or other tool such as a syringe or tube feeding device. These may require another person’s assistance. Placed at the side of the mouth as latch is initiated, small boluses of colostrum or milk can be provided to initiate fluid flow, as flow regulates suck. Some infants engage in rapid side-to-side head movements making latch difficult, painful, or impossible. As the infant is guided to the breast, touching the midline of the upper lip with the dropper will eliminate these movements and orient the baby to the breast (Figure 2). As the baby latches, placing a few drops of milk in the corner of the mouth will encourage a swallow followed by a nutritive suck (Figure 3).

If other latch techniques fail, a nipple shield may help initiate latch and compensate for weak sucking, as late preterm infants may lack the strength to draw the nipple/areola into their mouth and/or generate the ~60mmHg of vacuum (Geddes et al., 2008) to keep it in place. Mothers can hand express colostrum/milk into the shield tunnel or pre-fill the tunnel using a periodontal or oral syringe for an immediate sucking reward.

**Unsustained Sucking/Fatigue/Ineffective Milk Transfer**
Alternate massage/breast compressions are helpful in sustaining sucking, compensating for weak vacuum, and increasing milk transfer. The breast is massaged and compressed during pauses between sucking bursts, which improves the pressure gradient between the breast and infant’s mouth. Alternate massage is done on each side at each feeding until the infant no longer needs the extra assistance, taking care that the baby does not lose the latch. Care must be taken to assure that the volume compressed does not overwhelm the infant. For infants unable to transfer sufficient amounts of milk with alternate massage or with a nipple shield in place, a tube feeding device can be used or the tube from a tube

![Figure 2. Dropper-assisted latch](image)
feeding device can be run on top of or under the nipple shield to deliver pumped milk supplements.

**Supplementation**

If the infant cannot obtain adequate colostrum/milk directly from the breast, with the use of frequent cue-based feeds, with the use of alternate massage, with milk incentives at the breast, or with a nipple shield in place, then supplementation may be necessary. Expressed colostrum/milk in volumes of 5–10 ml every 2 to 3 hours on day one, 10–20 ml on day 2, and 20–30 ml on day 3 are suggested as appropriate physiologic amounts (Stellwagen et al., 2007). Mothers can hand express colostrum into a teaspoon (5 ml) and spoon-feed this to the infant (Hoover, 1998). If mothers use a breast pump to collect colostrum, pumping into a small container, such as an Ameda diaphragm or Medela colostrum collection container, placed between the valve and collection bottle may yield a greater quantity of retrievable colostrum.

Diabetic mothers may wish to bring prenatally expressed colostrum to the hospital should their infant need to be supplemented (Cox, 2006).

**Milk Production: Initiation and Maintenance if the Infant is Unable to Feed Effectively at Breast or Mother and Baby are Separated**

If the infant cannot gain appropriate weight by frequent feedings at breast, or with the use of pumped hindmilk, or with fortified breastmilk, then infant formula may temporarily be needed. Use of a hydrolyzed formula reduces the risk of sensitizing susceptible infants to allergies (Greer et al., 2008) or diabetes and may also lower bilirubin levels (Gourley et al., 2005).

Supplementation may be provided by tube feeding devices at the breast, cups, finger feeding, droppers, syringes, or bottles. Cup feeding allows the participation of the masseter and temporalis muscles, similar to their functioning while feeding at the breast (Gomes et al., 2006). Use of artificial nipples may weaken sucking in an infant who already demonstrates diminished vacuum generation at the breast (Ferrante et al., 2006; Mizuno & Ueda, 2006). Finger feeding with a tube feeding device requires the infant to generate vacuum to remove milk, as biting actions will not release milk as they do with an artificial nipple.

Manual expression during the first 48 hours may yield more colostrum than with the use of an electric pump (Ohyama et al., 2010). Combined techniques of manual expression, breast compression, and use of an electric breast pump have been shown to improve milk yield in preterm mothers (Morton et al., 2009). See **Appendix C**.

**Additional Resources Available Online**

- Appendix A: Sample in-hospital breastfeeding plan for the late preterm infant
- Appendix B: Sample breastfeeding discharge plan for the late preterm infant at home
- Appendix C: Pumping guidelines for mothers of late preterm infants

**Other Resources**

Evidence-based hospital breastfeeding protocols for late preterm infants.

- California Perinatal Quality Care Collaborative, Care and Management of the Late Preterm Infant Toolkit: Nutrition
- UC San Diego Health System Late Preterm Infant Protocol and patient resources
References


The controversy around mother–infant bedsharing continues to grow. In order to make sound policy recommendations, policy makers need current data on where infants sleep and how families handle nighttime feedings. The present study is a survey of 4,789 mothers of infants 0–12 months of age in the U.S. The findings indicate that almost 60% of mothers bedshare and that this occurs throughout the first year. These findings also indicate that 25% of mothers are falling asleep with their infants in dangerous sleep locations, such as chairs, sofas or recliners. Recommendations for promoting safe infant sleep are made.

**Keywords:** SIDS, bedsharing, infant sleep location, nighttime feedings, safe sleep

In 2005, the American Academy of Pediatrics (AAP) Task Force on SIDS\(^1\) issued a statement on safe sleeping practices for infants, recommending that infants “should not bedshare during sleep” (p. 1252). Subsequent to the AAP Statement, some local municipalities have attempted to make this point more strongly by telling parents to never bedshare, with public–service advertising designed to shock parents into compliance (see Figure 1).

In an attempt to present a simple “single message” to parents, these campaigns have, unfortunately, mischaracterized research findings regarding SIDS and infant sleep by indicating that “safe” sleep occurs in a crib and “unsafe” sleep occurs anywhere else. But the SIDS studies themselves indicate risk factors for infant death are not quite so simple. For example, a study of 325 SIDS cases from the UK found no excess risk of SIDS for term infants (>2,500 g at birth) who bedshared with non-smoking parents (Blair et al., 2006a). In a study of 238 SIDS cases in New Jersey, only 39% (N=93) were “bedsharing.” Of these, only 21 were breastfeeding, and most of these had other SIDS risk factors, such as non-supine position; pillows or fluffy blankets in the

\(^1\) Department of Pediatrics, Texas Tech University School of Medicine, Amarillo  
\(^2\) Department of Human Development and Family Studies, Texas Tech University, Lubbock  
\(^3\) While SUID (sudden unexplained infant death) may be a more accurate term, all of the studies cited used the term SIDS. We have chosen to use the term SIDS for consistency.
sleep area; substance abuse; couch/recliner sharing; or maternal smoking (Ostfeld et al., 2006). In 78% of these cases, families had anywhere from two to seven risk factors (Ostfeld et al., 2010).

One problematic aspect of this debate is confusion of terminology, such as including sofa or recliner sharing in definitions of “bedsharing.” These behaviors are not equivalent in terms of risk. For example, in a Scottish sample of 123 SIDS cases, the odds ratio of SIDS for couch/chair sharing was 66.9 (95% CI=2.8, 1597), compared to 1.07 for bedsharing infants 11 weeks or older (95% CI=0.32, 3.56). Of the 123 cases in this sample, 46 were bedsharing and 77 were not (Tappin et al., 2005). As dangerous as sofa–sharing is, it appears to be on the rise. In a 20–year population–based study in the UK, Blair and colleagues (2006b) found that while the number of SIDS cases dropped substantially as a result of the Back–to–Sleep campaign, there was an increase in “cosleeping” deaths due to “an increase in the number of deaths in infants sleeping with their parents on a sofa” (p. 314). They strongly recommended that parents avoid this dangerous sleep environment.

Methods

Study Participants

The data included in this analysis were from the U.S. mothers (N=4,789) who participated in the Survey of Mothers’ Sleep and Fatigue in 2008–2009. The total sample from this study was 6,410, representing 59 countries. The demographic characteristics of the U.S. sample are listed on Table 1 [click here]. Although this sample was comprised of primarily of breastfeeding mothers, they were evenly divided in their beliefs about where babies should sleep: 35% in the parent’s bed, 34% in a crib in another room, and 31% in the parents’ room.

Sample Recruitment

The sample was recruited via announcements and flyers distributed to WIC Breastfeeding Coordinators, U.S. State Breastfeeding Coalition Coordinators, U.S. Lactation Consultants and La Leche League Leaders. The investigators described the study and asked for assistance in recruiting mothers. Flyers and cards were distributed electronically and via hard copy, with a Web link for the survey. This survey was open to all mothers with babies 0–12 months of age who had access to the Internet.

Survey Development

The research questions were taken from the 253–item Survey of Mothers’ Sleep and Fatigue. The questions were predominantly close–ended in format and were developed for this study via open–ended interviews with mothers and feedback from mothers and health care professionals.

Data Collection

Data were collected via an online survey that was available on the Texas Tech University Department of Pediatrics website. A screening question asked for the baby’s age.
If the response was 12 months or less, the mother was allowed to continue the survey. The survey and data collection procedure was reviewed and approved by the Texas Tech University School of Medicine Institutional Review Board.

Results & Discussion

Bedsharing Rates

The results of this survey suggest that bedsharing is common in the U.S., despite campaigns against it. The percentages of bedsharing families varied considerably depending on how the question was worded. When asked, “where does your baby sleep, that is where does your baby spend most of the night?” 44% mothers indicated that their babies were in their beds (see Figure 2). When asked where their babies start the night, only 31% were bedsharing (see Figure 3). When asked where babies end the night, 59% of infants were bedsharing. Our findings indicate that bedsharing rates persist throughout the first year, and were as high as 62% (Figure 4). These figures also indicate that infant sleep locations are fluid and change over the course of the night.

Although bedsharing is common across demographic categories, it is significantly more common in single, divorced or separated women, and in African American, American Indian and Caucasian women. Bedsharing was more common among lower-income families, but still occurred in slightly less than half of affluent families. A similar pattern emerged based on education. While more educated mothers were slightly less likely to bedshare, over half of highly educated mothers still did so. Bedsharing was significantly more common when mothers were exclusively breastfeeding. [For more information, see Table 2.]

Location of Nighttime Feedings

Of mothers in our sample, approximately half (N=2,103) were still feeding their babies at night. Nighttime feedings took place either in bed (44%) or on a chair, recliner or sofa (55%). When asked if they sometimes fall asleep in this location, not surprisingly, 72% of mothers who feed in bed indicated that they fall asleep. More alarming is that 44% of mothers feeding on chairs, sofas or recliners fall asleep there. This group comprises 25% of the group that is still feeding at night. Women with higher the levels of education and income were more likely to feed their babies at night on chairs, couches or recliners (see Figures 5 & 6). High-income, highly educated mothers are generally “low risk” in terms of infant mortality. Possibly in an attempt to avoid bedsharing, this generally low-risk group is engaging in high-risk behavior.

Feedback Mothers are Receiving

Bedsharing mothers (86%) were significantly more likely to receive negative feedback from friends and family about where their babies sleep than when babies

Figure 2. Where does your baby sleep? That is, where does your baby spend most of the night? U.S. Sample (N=4434), χ²(10)=440.425, p<.0001

Figure 3. Where does your baby start the night? U.S. Sample (N=4336), χ²(10)=415.023, p<.0001

Figure 4. Where does your baby end the night? U.S. Sample (N=4399), χ²(10)=365.36, p<.0001

\( \chi^2 \) refers to changes in infant sleep location over time
roomshare (8%) or sleep in cribs in a different room (6%; \( \chi^2(2)=681.64, p<.0001 \)). Further, bedsharing families (70%) are significantly less likely to tell their health care providers about where their babies end the night than those whose babies roomshare (13%) or whose babies sleep in different rooms (17%; \( \chi^2(2)=132.75, p<.0001 \)). These findings suggest that the mothers in our study are well aware of the prohibitions against bedsharing. So why do they persist?

**Reasons for Sleep Arrangements**

When asked about their reasons for their current sleep arrangements, bedsharing mothers were significantly more likely to indicate that it was the right way to do it (61%) than mothers who roomshare (13%) or have babies in a different room (26%; \( \chi^2(2)=6.90, p<.032 \)). Bedsharing mothers were also more likely to indicate that their sleep arrangement was the only way that worked for them (69%) as compared to those who roomshare (9%) or have babies in a different room (22%; \( \chi^2(2)=162.9, p<.0001 \)). In other words, bedsharing mothers have both ideological (“the right way to do it”) and pragmatic (“the only way that worked”) reasons for bedsharing that are unlikely to change due to pressure from health care providers or public-health initiatives. These findings are similar to those of Chianese et al. (2009), who conducted a focus-group study with inner-city mothers. These mothers cited the following reasons for bedsharing: better mother-infant sleep, convenience, tradition, child safety, and parent-child emotional needs. They indicated that clinicians’ advice did not influence their decisions. But they indicated that they would appreciate advice on safe bedsharing.

**Conclusions**

- Despite ongoing anti-bedsharing campaigns, U.S. parents continue to bedshare in high numbers.
- Bedsharing families cite both ideological and pragmatic reasons for sleeping with their babies. They appear well-aware of prohibitions against bedsharing, but consistent with the results of previous studies, the majority continue to bedshare.
- In a possible attempt to avoid bedsharing, 55% of mothers feed their babies at night on chairs, recliners or sofas. Forty-four percent (25% of the sample) admit that they falling asleep with their babies in these locations. Of all sleep locations, chairs, sofas and recliners are by far the most dangerous and dramatically increase the risk of suffocation.

**Recommendations**

Safe-sleep campaigns should include information on safe bedsharing. In absence of this information, parents are likely to continue bedsharing, but may do so in unsafe ways. Alternatively, safe-sleep campaigns could provide other strategies, such as encouraging babies to sleep on adjacent, yet separate, surfaces.

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Resources on Safe Sleep

AAP SIDS Policy Statement
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Mentoring Our Future

Mentoring is more than just training! In Mentoring Our Future, author Denise Altman, RN, IBCLC, LCCE describes the nuts and bolts of mentoring. She begins with the basic structure for mentoring and adds real-life stories about good and bad mentoring experiences. She has included many personal stories from leaders in the field of lactation. Altman includes practice challenges from real life scenarios to stimulate your thinking about creative ways to solve problems in your practice setting.

Mentoring Our Future does not tell you what to teach, but rather gives you the elements of mentoring and tells you how to create a mentoring program or process. This book covers:

- The history of mentoring and considerations for mentoring
- How to create a mentoring program
- The levels of mentoring, from observation to internship
- How to identify who to mentor
- How to create an individualized mentoring experience
- What to do if the mentoring relationship breaks down
- How to move on after the mentoring relationship ends

Mentoring Our Future is the perfect resource for anyone who wants to help others on the pathway to becoming a professional lactation specialist at any level. Clinical nurse managers, WIC coordinators, small business owners, La Leche League Leaders, doctors, dietitians, midwives, doulas, volunteers, or any breastfeeding advocate can use the guidelines in this book to create a successful mentoring program in their organization.

See more and order online at www.ibreastfeeding.com

1712 N. Forest • Amarillo, Texas • T: 806.376.9900 F: 806.376.9901