Facilitating Autonomous Infant Hand Use During Breastfeeding

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Catherine Watson Genna, BS, IBCLC, RLC [1]
Diklah Barak, BOT[1]

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

[1] Private practice, New York City

Figure 1a. Baby looking intently at his hands hugging breast.

Figure 1b. Latching with tongue down.

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

Figure 2a. Baby resists maternal breast pushing.

Figure 2b. He relaxes his hand once latched.

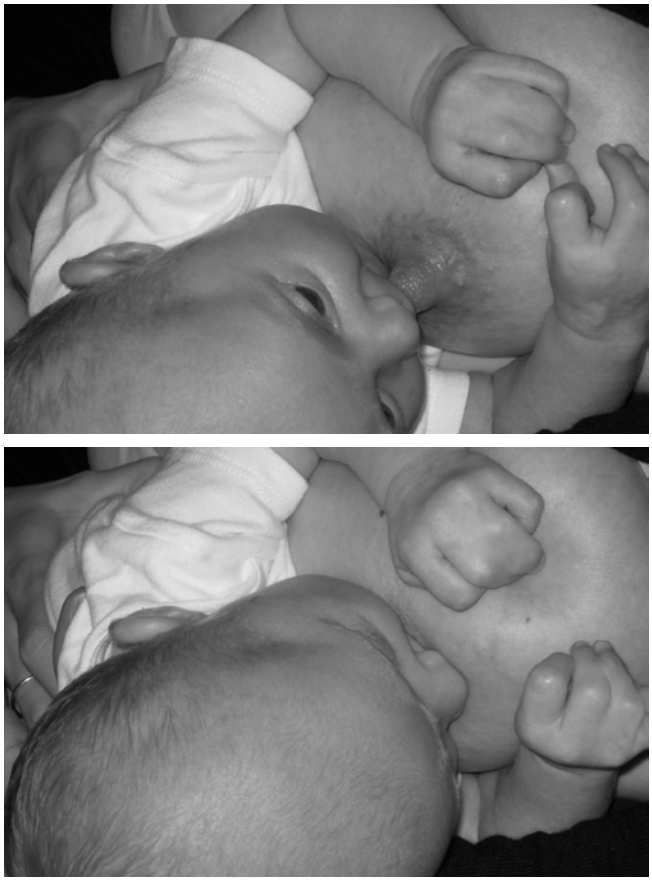

Figure 3a and 3b. Baby pulling the breast into the mouth.

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

Video Captions

In video a, the baby pushes off the breast and immediately returns to the spot her hand rested on before, and on video b, teaching mom to use cheek to breast to help her baby relax her hands and use oral searching (see Figure 7).

In video c, the baby spontaneously and repeatedly shapes the breast to make the areola bulge out until he can orally grasp the breast (see Figure 4).

to help her attach more deeply. In video b the same baby moves the hand away and latches, when brought

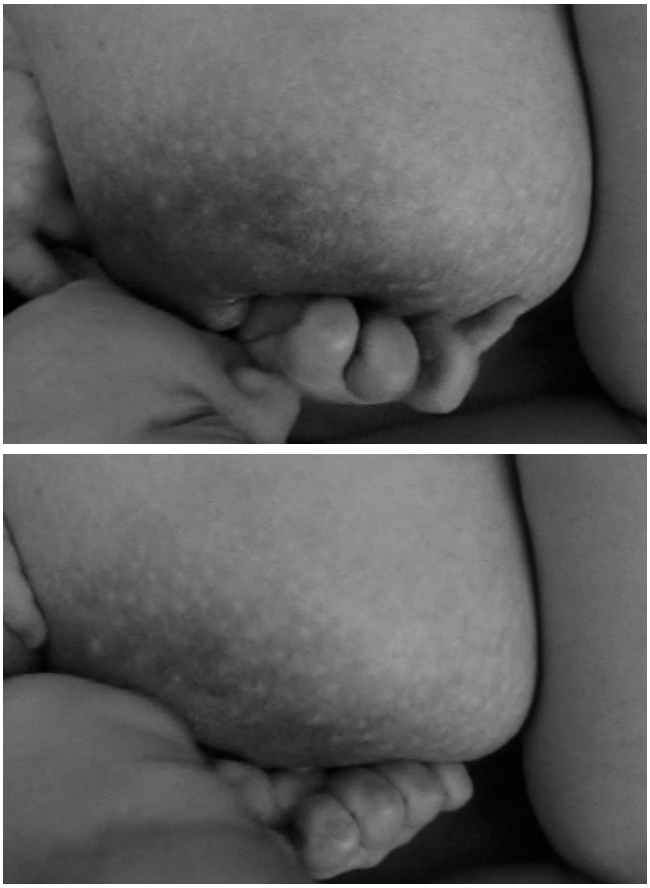

Figure 4a and 4b. Baby shaping breast and latching.

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.

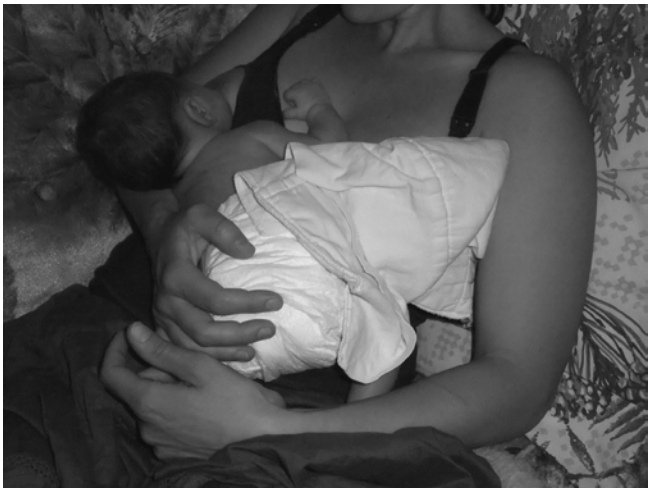

Figure 5. Laid–back breastfeeding position

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 6 a and b illustrates the infant response to this appropriate stimulus.

Figure 6a. Chin to breast and nipple to philtrum

Figure 6b. Resultant large gape

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.

Figure 7. Cheek on breast orients baby and allows her to relax her hands.

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

Figure 8a. Baby on mom's chest

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

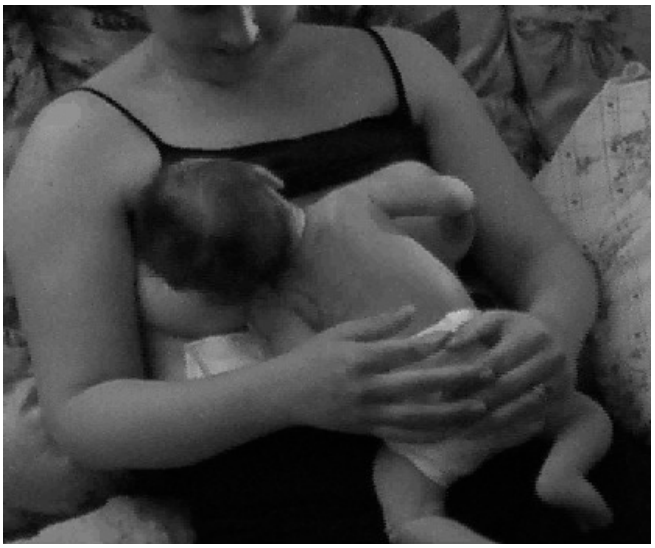

Figure 8b. Scanning for the breast with his cheeks.

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.

Figure 9. Baby sucking hand placed immediately below the nipple. Once calmed, the baby moves the hand and attaches to the breast in the same place.

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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