

FIGURE 7-5 Supporting the breast using palmar grasp (A); scissors hold (B). Thumb and fingers are outside the areola. (From Spangler A. Amy Spangler's breastfeeding: a parent's guide. 7th ed. Atlanta: Author; 1999.)

This should alleviate the problem, and the infant will be able to breathe freely.

For the first week or so, the mother will need to hold her breast in place during the feeding. After that time, she should be able to get the feeding started and then let go, unless her breasts are unusually large. Certainly, the large breast should not at any time rest on the infant's chin. The infant who requires continuous breast support throughout the feeding after week 1 may need further evaluation.

Basic Positions for the Newborn

Three basic positions can be used when breastfeeding: (1) *cradle hold* (sometimes called *Madonna hold*), (2) *side-lying hold* (sometimes called *parallel hold*), and (3) *football hold* (sometimes called *clutch hold*). Regardless of which position is used, the infant's ventral surface should always be skin-to-skin with the mother's ventral surface; this is generally referred to as *tummy-to-tummy* or *chest-to-chest*. This technique permits the newborn's head and neck to be in good alignment; if the infant is not chest-to-chest, he will need to turn his head to breastfeed, which interferes with swallowing. Teach the mother to recognize the difference between chest-to-chest, as shown in Fig. 7-6, and chest-to-ceiling, as shown in Fig. 7-7. When the

infant is not chest-to-chest, point it out to the mother. Help her visualize a camera that is hanging from the ceiling; if the camera would "see" the infant's skin between his nipples and umbilicus, he is not chest-to-chest.

Cradle Position. The cradle position, shown in Fig. 7-8, is used most frequently and works well for most mothers. Mothers generally identify this position first because it is similar to the position they have seen used by bottle-feeding mothers, but it is only one option and sometimes not the best option for the circumstances. A few important points about the cradle position that are often overlooked include the following:

- Make sure mother and newborn are chest-to-chest.
- Discourage the mother from holding her newborn above the level of the nipple; the milk would need to overcome gravity to be transferred to the infant.
- Alert the mother not to hold the newborn below the level of the nipple; this will cause a "drag" on the nipple and subsequent bruising.
- Point out that the infant's head should not be directly in the antecubital fossa, as bottle-fed infants are held. Rather, the infant should rest slightly lower on the mother's forearm to ensure better alignment.



FIGURE 7-6 Cradle hold, with **correct** chest-to-chest positioning and no space between the mother's body and newborn's body. This adolescent mother is supporting her newborn's buttocks close to her body, holding him skin-to-skin. (Copyright Debi Bocar, Lactation Consultant Services, Oklahoma City, OK.)

- Encourage the mother to hold the newborn at the base of the neck, not on the crown of the head. This usually occurs when her fingers are pointing toward the ears, rather than toward the crown, as shown in Fig. 7-9.
- Instruct the mother to avoid pushing the newborn's head onto the breast or holding it there. The newborn needs the freedom to adjust, if necessary.
- Facilitate flexion of the infant's knees and hips; flexion enables him to maintain postural control.

Side-Lying Position. The side-lying position, shown in Fig. 7-10, works well for nighttime

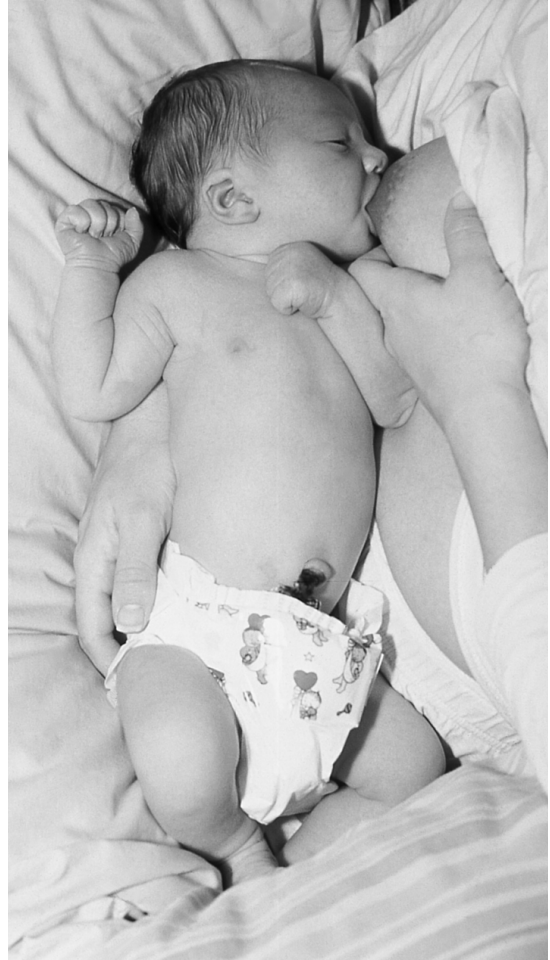


FIGURE 7-7 Cradle hold, **incorrect**. Newborn is mostly on his back, making it necessary for him to turn his head to the breast. (Copyright Debi Bocar, Lactation Consultant Services, Oklahoma City, OK.)

feeding, when the mother does not want to get up and sit in a chair, or after a vaginal birth when the mother is trying to avoid sitting on her "sore bottom." It also works for mothers who have had cesarean deliveries. Furthermore, the mother who has had a cesarean delivery may be able to use both breasts without rolling over. Instruct the woman to feed first from the bottom breast (the one nearest the mattress); then, when the infant has finished on that side, she can "tuck" the first breast under



FIGURE 7-8 Cradle hold. Newborn is curled around mother's abdomen in cradle hold with pillow support. Mother supports breast with palmar grasp. (Copyright Debi Bocar, Lactation Consultant Services, Oklahoma City, OK.)



FIGURE 7-9 Mother grasps infant so that he can readjust his head if he needs to. (Pointing fingers toward his ears.) (Copyright Debi Bocar, Lactation Consultant Services, Oklahoma City, OK.)



FIGURE 7-10 Side-lying hold. (Copyright Debi Bocar, Lactation Consultant Services, Oklahoma City, OK.)

her torso and offer the upper breast. This “elevator position” works reasonably well for mothers who have average-sized breasts. (It works less well if the mother has especially small or especially large breasts.) Use a rolled-up receiving blanket behind the newborn to maintain his position and a pillow tucked behind the mother's back to maintain her position and comfort.

Football Position. The football hold, shown in Fig. 7-11, is useful for mothers who have had a cesarean delivery because it eliminates the fear that the infant will kick the mother's incision. The football hold is also useful if the mother needs better visualization of the latch-on process. It can also be used when the mother wishes to offer a second breast without moving her own position; she can move the infant from a cradle position on the left breast to the football position on the right breast.

These common positions should work well under most circumstances. Special circumstances, such as when the infant has any sort of hypotonia or craniofacial abnormality, however, require other techniques, discussed in Chapter 11.

Any of the basic positions can be used (regardless of whether the woman had a vaginal or cesarean birth), but the mother should be encouraged to find the one that is most comfortable for her, given her set of circumstances. A summary of



FIGURE 7-11 Football hold. (Copyright Debi Bocar, Lactation Consultant Services, Oklahoma City, OK.)

advantages, disadvantages, and important tips is provided in Table 7-2.

Feeding-Related Questions

Mothers raise numerous questions to which nurses must respond. The most important guideline to answering questions is this: Keep it simple! Creating too many “rules” for breastfeeding only dissuades women from continuing. The following are some common questions.

One Side or Two? Presuming that the infant is still awake and not showing signs of satiation, the mother should offer the second breast. It is ideal for the infant to stimulate both breasts, particularly during the first month, but it is not

imperative. Sometimes, removing the newborn from the first breast for the sole purpose of stimulating the second breast may deprive him of the hindmilk that, left to his own efforts, he would have happily suckled. When interrupted before finishing, preterm newborns may “forget” what they were doing when offered the second breast.

Suckling only one side at a feeding appears to have little if any effect—positive or negative—on infant well-being. Infants exhibit no differences in restlessness, crying, frequency of feedings, wet diapers, or loose stools when fed from one rather than two breasts.⁴⁶ In infants older than 1 month, feeding on one side or both sides can affect the fat concentration in one particular feeding, but the net intake over a 24-hour period suggests that “baby-led” feeding is preferable.⁴⁷

Alternating sides is done to provide more or less equal stimulation for the mother’s breasts. Whether the infant suckles one side at a feeding or both, the aim should be to start on the side that received the least (or no) stimulation. The infant suckles most vigorously on the first side, so feeding should start on the side where the newborn left off last time, or if he suckled only one side, the feeding should start with the side that he did not suckle at the last feeding. It is easiest for mothers to remember this if they attach a pin to the bra on the side where they wish to begin next time.

Starting on the side where she left off might not always be practical, however. If, for example, the mother has an intravenous (IV) site in a location that would make breastfeeding awkward, it would do no harm to start on the side where she is most comfortable until after the IV is removed. This strategy increases her chances for feeling successful and increases the likelihood of successful milk transfer to the infant. If the mother has a sore breast, correct the root of the problem, but meanwhile start on the least sore side first because the infant suckles more vigorously on the first side.

Mothers often comment that the infant has a “favorite” side. In reality, the mother probably is more comfortable holding the infant on one side—usually the left side, regardless of which

Table 7-2 ADVANTAGES AND LIMITATIONS OF BASIC POSITIONS

Position	Advantages	Limitations	Pertinent Points
Cradle hold	<ul style="list-style-type: none"> • Women are most likely to have seen this position used • Works best for most situations 	<ul style="list-style-type: none"> • Difficult to achieve good sitting position in hospital bed; use chair if possible • Requires sitting; cesarean incision or hemorrhoids may make sitting a less desirable position 	<ul style="list-style-type: none"> • Be sure that infant is chest-to-chest rather than chest-to-ceiling • Infant should be at the level of the nipple
Side-lying hold	<ul style="list-style-type: none"> • Helpful after cesarean birth • Great for nighttime feedings 	<ul style="list-style-type: none"> • Difficult to visualize latch-on 	<ul style="list-style-type: none"> • Be sure that infant is chest-to-chest rather than chest-to-ceiling • Use folded receiving blanket behind infant to maintain chest-to-chest position • Mother's body should be at a slight angle to the mattress, leaning backward just a bit against a pillow
Football hold	<ul style="list-style-type: none"> • Helpful after cesarean birth • Helpful for women with especially large breasts • Provides better visualization of latch-on process 	<ul style="list-style-type: none"> • Often difficult to do sitting up in hospital bed 	<ul style="list-style-type: none"> • Be sure that infant is chest-to-chest rather than chest-to-ceiling

hand is dominant. Mothers may ask what will happen if the infant feeds more often or more vigorously at the same side over a period of time. Reassure the mother that nothing “bad” happens; the uneven stimulation may result in one breast being slightly larger than the other, but the infant experiences no negative effects.

Rotating Positions. Mothers are commonly told that they must always alternate the position they use—cradle hold this time, side-lying next time, and football hold the next time. This advice is based on the idea that pressure from the infant’s mouth will cause soreness to the mother’s nipple. This advice is not necessarily bad, but it usually is superfluous. First, it requires the mother to learn several positions when she may be struggling to learn just one. Second, poor latch-on, in any position, is usually the cause for sore nipples; rotating the position will not prevent sore nipples if this

is the root of the problem. However, rotating positions may be useful if the infant has a barracuda style of sucking.

Burping and Sleep Positions. Typically, mothers think that infants should be positioned over their shoulder and patted vigorously for burping. This is usually unnecessary. Infants can be burped simply by keeping their torso straight—explain that the “food pipe” needs to be straight. If the infant is crying, however, instruct the mother to put him over the shoulder. An infant can also be burped by sitting him on the caregiver’s lap with a hand on his chest, leaning the infant forward a bit. Recommend to mothers that they give the newborn the opportunity to burp after suckling one breast, but if the infant does not burp, reassure mothers that they do not need to worry about it; some infants do not take in much air and will not need to burp. Signs that the infant needs to burp

include arching the back, throwing out the legs, and pulling away from the breast.

MECHANISMS OF INFANT SUCKLING

The Sucking Sequence

Several studies have shown the movements associated with feeding. Ardran and colleagues performed two landmark studies, the first on artificially fed infants⁴⁸ and the second on breast-fed infants.⁴³ Movements of the nipple, jaw, and tongue were clearly seen. Later, using ultrasound, Woolridge visualized the movements involved in suckling the breast and had an artist create drawings to replicate the ultrasound image of the suck cycle.⁴⁹ Fig. 7-12 shows the sucking cycle and gives a description. A few points are especially notable.

Nipple

The nipple and areola are drawn into the mouth, and a teat is formed that is approximately three times the length of the resting nipple. Despite technology's attempts to manufacture a teat to mimic the human nipple, no artificial nipple lengthens like the human nipple.⁵⁰

Jaw

The jaw should move up and down in a rhythmic motion when milk transfer is occurring. The observer will also see the infant's ears wiggling. The cheeks should be full and rounded, not sucked in.

Lips

Both upper and lower lip should be flanged, although not too far. Sometimes, particularly in preterm or hypotonic infants, the lower lip folds inward, resulting in a sucking blister for the infant and sore nipples for the mother.

Tongue

The tongue should be troughed—cup-shaped or scoop-shaped—and should begin movement at the bottom of the mouth, extending over the lower alveolar ridge. When the lateral aspects of the tongue are troughed in this way, the tongue can correctly draw in the nipple, press it against the hard palate, and form a teat. The tip of the tongue

does not create friction along the teat (like fingers squeezing the length of a nearly empty tube of toothpaste). Rather, the tongue humps up from back to front in an undulating movement when milk is transferred.

Reflexes

Reflexes are important factors in milk transfer. Rooting, sucking, and swallowing help initiate and sustain milk transfer.

Rooting

The rooting reflex, usually defined as a one-component operation, is more accurately described by Woolridge as having two components: "(1) tactile stimulation of the skin around the mouth causes the infant to turn his head towards that source of stimulation, and (2) his mouth gapes in preparation to accept the nipple."⁴⁹ This second component is called the *oral searching reflex* by Righard and Alade.⁵¹ The term used for this action is unimportant; what is important is that the newborn exhibits the gaping, open-wide behavior before attaching to the breast.

Sucking

The sucking reflex is elicited by tactile or chemical stimulation of the *palate*, not the tongue.⁴⁹ Although we are tempted to assume that the sweet taste of the milk stimulates sucking, Woolridge emphasizes that the lower jaw and tongue are the motive force for milk expulsion; therefore the palate, situated above the jaw and tongue, provides a target for stimulation by the nipple.

The sucking reflex is often misunderstood. The word *suck* conjures up a notion of negative pressure, for example, sucking through a straw creates suction (i.e., negative pressure). When the infant suckles the breast, the suction (i.e., *negative pressure*) created is only related in small part to milk transfer; transfer of milk is accomplished mostly by the *positive* pressure of the jaw and tongue in an undulating motion compressing the teat against the hard palate.

A landmark study of infants using artificial teats showed that they were not able to fully compress the rubber teat.⁴⁸ Admittedly, today's rubber

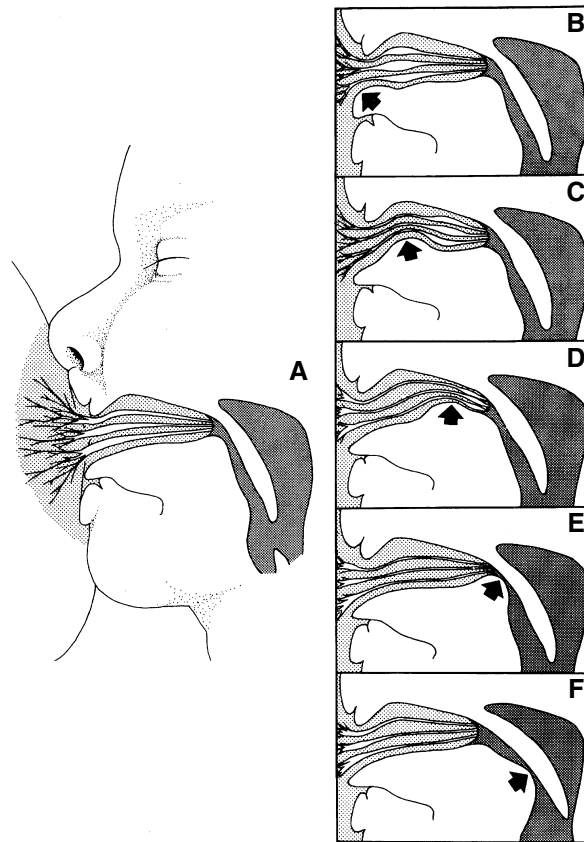


FIGURE 7-12 A complete suck cycle; the baby is shown in median section. The baby exhibits good feeding technique with the nipple drawn well into the mouth, extending back to the junction of the hard and soft palate (the lactiferous sinuses are depicted within the teat although these cannot be visualized on scans). **A**, Teat is formed from the nipple and much of the areola, with the lacteal sinuses, which lie behind the nipple, being drawn into the mouth with the breast tissue. The soft palate is relaxed and the nasopharynx is open for breathing. The shape of the tongue at the back represents its position at rest, cupped around the tip of the nipple. **B**, The suck cycle is initiated by a welling up of the anterior tip of the tongue. At the same time, the lower jaw, which had been momentarily relaxed (not shown), is raised to constrict the base of the nipple, thereby pinching off milk within the ducts of the teat (these movements are inferred because they lie outside the sector viewed in ultrasound scans). **C**, The wave of compression by the tongue moves along the underside of the nipple in a posterior direction, pushing against the hard palate. This rollerlike action squeezes milk from the nipple. The posterior portion of the tongue may be depressed as milk collects in the oropharynx. **D** and **E**, The wave of compression passes back past the tip of the nipple and pushes against the soft palate. As the tongue impinges on the soft palate, the levator muscles of the palate contract, raising it to seal off the nasal cavity. Milk is pushed into the oropharynx and is swallowed if a sufficient amount has collected. **F**, The cycle of compression continues and ends at the posterior base of the tongue. Depression of the back portion of the tongue creates negative pressure, drawing the nipple and its milk contents once more into the mouth. This is accompanied by a lowering of the jaw, which allows milk to flow back into the nipple. In ultrasound scans it appears that compression by the tongue and negative pressure within the mouth maintain the tongue in close conformation to the nipple and palate. Events are portrayed here more loosely to aid clarity. (From Woolridge MW. *Midwifery* 1986;2:164-171.)

nipples are more pliable than those used in the study, but the infant using an artificial teat still obtains milk transfer primarily through negative pressure. An example may help illustrate this concept of negative and mechanical pressure. Assume that the plastic-liner type of bottle is being used. If the infant could exert enough negative pressure, he could presumably use only this method to obtain milk from the container. If he could not, an adult could use her cupped hand to alternately compress and release the plastic bag—exerting mechanical pressure only—and the milk would shoot out; with either type of pressure, milk would be transferred from one place to another.

During breastfeeding, mechanical pressure is the primary method of obtaining milk; the infant's jaws and tongue are beneath the breast's lactiferous sinuses, compressing them (much as the adult's hand would compress the bag in the preceding example). The negative pressure that the infant exerts is used primarily to hold the nipple and the areola in place, resulting in a good seal, but contributes only minimally to obtaining milk.

Lawrence and Lawrence⁵² differentiate between *suckling* and *sucking*. Suckling means “to take nourishment at the breast and specifically refers to breastfeeding in all species. Sucking, on the other hand, means to draw into the mouth by means of a partial vacuum, which is the process employed during bottle feeding. Sucking also means to consume by licking.”⁵² Here and in most other texts, the terms are used somewhat interchangeably. There must be a clear understanding, however, that milk transfer while breastfeeding is dependent on mechanical, not negative, pressure. The terminology helps delineate the two feeding modes, nutritive and nonnutritive, used by the infant.

Wolff⁵³ first identified two different modes of sucking: nutritive and nonnutritive. Although his classic study was conducted with artificially fed infants, he defined *nonnutritive sucking* as that which occurs in the absence of fluid. At the beginning of a feeding session, the infant exhibits nonnutritive sucking characterized by a pattern of short bursts of fast sucking (rate of about two per second). Wolff concerned himself with two basic premises: presence or absence of palatable fluid

and the rate of sucking in relation to the presence or absence of fluid.

As soon as palatable fluid enters the mouth, nutritive sucking begins for the artificially fed infant. Wolff's study showed that nutritive sucking occurs at a slower, more continuous rate of about one per second with the presence of fluid, and later studies confirmed that this initial nutritive sucking and faster sucking rate occur in breastfed infants as well.

Similarly, breastfed infants begin with a faster, two-per-second type of suck, which helps the mother achieve a milk-ejection reflex (MER). At this time, the infant is exerting only negative pressure, and in the absence of fluid in the oral cavity, the negative pressure will be highest (and therefore pressure on the mother's nipple greatest). When the mother has an MER, nutritive suckling begins. This is exhibited by a slow, rhythmic suck of about one per second, with no pauses in the early stages. After the MER, there is a decreased need for negative pressure because of fluid in the oral cavity, and hence maternal discomfort disappears.

As the feeding progresses, however, some differences between the breastfed and artificially fed infant are notable. Artificially fed infants show a distinct difference between nonnutritive and nutritive sucking, eventually returning to the faster suck exhibited at the beginning of the feed. Unlike artificially fed infants, breastfed infants have a less clear distinction between the nutritive and nonnutritive modes after the feeding has progressed for a while. The change in sucking rate varies inversely with milk flow; the higher the milk flow, the slower the rate.⁵⁴ As the milk flow decreases toward the end of the feed on each breast, the sucking rate within sucking bursts increases, but there are more and longer rests between bursts.⁵⁵ For this reason, the observer or mother can see when the milk starts to flow, as the infant's suckling rate slows down when the mother experiences an MER. Similarly, suckling returns to a more rapid rate as milk becomes less abundant and flow diminishes. Suckling terminates with sleep (in infants younger than 12 weeks). Both the behavior (satiation ending with sleep) and age (younger than 12 weeks) are important factors in determining whether the