LEARNING OBJECTIVES

After reading this article, the reader should be able to:

- Identify four infant safety issues to discuss with parents prior to discharge.
- Name three challenges to parent education and identify three strategies to deal with them.
- Be able to teach parents how to recognize a sick neonate.

Newborn babies do not come with instruction manuals. Professional maternal and neonatal nurses must teach parents how to care for their newborn infant prior to discharge. In the days when new mothers had longer hospital stays, there were 3-4 days in which to teach parents how to care for their babies. Today, with 48-hour hospitalization for normal vaginal births and 96 hours for C-sections, we no longer have that luxury. If families opt for early discharge and meet the American Academy of Pediatrics (AAP) and American College of Obstetrics and Gynecology (ACOG) criteria we may only have 24 hours to teach parents how to care for the newborn at home.

Parental expectations and the reality of caring for a newborn rarely match. Parenting is not an instinct, it is a learned behavior. Parenting a new baby can be overwhelming. Usually it is the hardest—if most rewarding—job an adult will ever have.

So what can professionals do to make this transition to parenting successful? Maternal-newborn nursing professionals are not the primary caretakers for the newborn; our role is to care for the parents, so that they are able to care for their baby. First and foremost we empower parents with knowledge and information. Every encounter with the family is a teaching opportunity. It is best to teach both parents, or a parent...
and supportive/significant others, together. The crisis of parenting a newborn occurs in the first 3 weeks after birth, so that seeing the family within days of discharge and in the first 2 weeks are opportunities to guide and counsel parents.

Both professionals and parents may have unrealistic expectations of the childbearing experience and the role of the maternal-newborn nurse. Some parents choose a hospital expecting a two-day stay in a luxury hotel, with nurses available as glorified maids and babysitters. Even other health professionals see the maternal-newborn nurse as someone who sits, rocks, and feeds babies all day! Indeed, what philosophy is implied in our own maternal-newborn nursing departments? Are we more concerned about “patient satisfaction scores” (i.e., meeting parental expectations of a pleasant experience) rather than preparing parents to safely care for their newborn baby?

Maternal-newborn nurses should be first and foremost teachers, coaches and supporters of new parents. As “Partners in Care” we model and role model for new parents in how to care for their infant—and themselves. As professional nurses we are patient advocates and we can empower parents to become advocates for their infants and children. We collaborate with parents in making decisions for both inpatient and outpatient care for the neonate. We ensure that parents understand and are able to comply with those plans. Because parenting is not a “spectator sport,” we facilitate, encourage and assist parents in becoming the primary caretaker for their newborn.

Challenges to Parent Education
Numerous barriers and challenges to parent education, originating from parents as well as professionals, exist. These include time, language, literacy, work design, expectations and ability to form a therapeutic relationship. Table 1 lists some challenges and potential solutions.

A cogent example of fostering parent education through participation in the newborn’s care is illustrated in the research by Medves and O’Brien on the baby’s first bath. These researchers wanted to examine the temperature stability of term, normal newborns given their first bath by either a nurse or the baby’s parents. Some newborns were given their first baths in the traditional way—in the nursery, by a nursery nurse and under a radiant warmer. Others were given their first bath by the parents in the mother’s room, with a nurse teaching and supervising. In both scenarios, the full-term infant’s temperature dropped one degree after the bath. The researchers concluded that with supervision and teaching by a nurse, parents can safely give their newborns the first bath. One might expect that parents would be reluctant to give permission for their newborns to be studied. These researchers were surprised at how easily they were able to recruit newborns and parents for their study because parents actually wanted to give their babies the first bath.

There is no need for nursery nurses to give baths or change diapers. Parents not only need to learn and practice bathing, diapering, and caring for their babies—they want to do so. Yet many neonatal nurses persist in delivering care “the way we’ve always done it.” Some believe that parents prefer that nurses care for their baby so that parents can rest. Many feel that caring for the infant is faster and more efficient than teaching the parents how to do so. Nurses drawn to this specialty sometimes prefer to interact with babies more than with adults. Nevertheless, we need to offer parents more opportunities to care for their infants in the hospital. As the studies show, they not only need to, but actually want to participate.

Content of Parent Education
Box 1 lists major content areas for parent education of the late preterm or term newborn. The nutrition article in this issue discusses nutrition education about both breast and bottle feeding that should be taught to parents prior to discharge.

Box 1: Content of Parent Education Prior to Discharge of the Late Preterm/Term Newborn
- Nutrition (in accompanying article)
- Elimination
- Crying
- Sleeping
- Skin care
- Clothing
- How to recognize a sick baby
- Safety
- Developmental needs
- Parental needs

Elimination
After feeding, one of the most important topics of interest to new parents is elimination—“pees” and “poops.” Term neonates produce 1-3 cc/kg/hour of very dilute urine with a specific gravity of 1.002-1.012. Well-hydrated newborns have 8-10 wet diapers/day and moist mucus membranes. The frequency of normal neonatal bowel movements ranges from one every time the baby feeds to one stool/week. Newborn infants have a gastrocolic reflex that results in a stool every time the stomach is stimulated with food, but as the GI tract matures this frequency of stools decreases. The consistency of neonatal stools changes in the first days of life from: (a) thick, dark green meconium, to (b) seedy, transitional stools when milk has completely traversed the intestinal tract, to (c) breastfed (liquid yellow stools) or formula fed (soft-formed yellow to light brown) stools.

Crying
Babies are astute at nonverbal communication. Research has identified types of crying that reflect the infant’s state and needs: birth cry, distress call, hunger, pain, spontaneous
# Table 1: Challenges and Potential Remedies for Parent Education

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Potential Remedies</th>
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<tbody>
<tr>
<td><strong>What do professionals contribute?</strong></td>
<td></td>
</tr>
<tr>
<td>• Amount of content—review discharge teaching sheets.</td>
<td>When and with whom will the parents have their first follow-up visit? What basic information do parents need till the first visit, at which time the outpatient care provider continues parent teaching. Multimedia.</td>
</tr>
<tr>
<td>• Time: Do more with less. “It is faster if I do it myself than if I teach the parent to do it?”</td>
<td>Parents learn by doing, so have more than one set of parents perform “first baths” while a single RN supervises and teaches.</td>
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<td>• Work redesign. “We’ve always done it this way!”</td>
<td>Is “What we have always done evidence-based and efficient?” Group learning, like group prenatal care such as Centering Pregnancy, may be just as, or more effective and efficient.</td>
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<tr>
<td>• Difficulty with change</td>
<td>Mother-baby care and primary nursing are both more consistent and patient-centered, but may be considered unnecessary to some care providers.</td>
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<tr>
<td>• Burnout. “If I’ve said this once, I’ve said this a million times…”</td>
<td>Small group learning experiences, use of media and self-paced learning as options.</td>
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<tr>
<td>• Ability to form a therapeutic relationship…or not</td>
<td>The crisis of parenting requires a minimal number of care providers for both parents and neonates. Use of mother-baby care and primary nursing ensures consistency and continuity.</td>
</tr>
<tr>
<td>• Lack of consistency—different patient assignments daily.</td>
<td>Use of peer support, peer teaching, multimedia and modeling/role modeling and mentoring from older nurses to younger mothers.</td>
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<tr>
<td>• Ageism—older nursing workforce and young childbearing women.</td>
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</tr>
<tr>
<td><strong>What do parents contribute?</strong></td>
<td></td>
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<tr>
<td>• Culture/ethnicity</td>
<td>Culturally competent care and communication, understanding by care providers of the values, beliefs, customs, and behaviors of the cultural and ethnic groups using maternal-newborn services. Use resources such as: Shah M: Transcultural aspects of perinatal health care: A resource guide, Washington, DC: National Perinatal Association, 2004.</td>
</tr>
<tr>
<td>• Language</td>
<td>A qualified, acceptable, bilingual and bicultural interpreter provided by the facility or the family. Do not use strangers, untrained hospital staff or children as interpreters. Telephone interpreter services.</td>
</tr>
<tr>
<td>• Literacy/ Illiteracy—inability to read the language one speaks. US reading level is 12th grade, but comprehension level is only 6th grade.</td>
<td>Do not assume that parents are able to read written materials, even if written in their spoken language. Illiterate adults will not disclose this fact because of shame. But illiterate does not mean unintelligent. Use other forms of teaching besides the written word: pictures, diagrams, videos, verbal instructions.</td>
</tr>
<tr>
<td>• Expectations—of hospitalization, of the birth experience, of parenting</td>
<td>When the birth experience deviates from parental expectations, perinatal grief is experienced and needs to be facilitated by care providers. Mothers also need to be assisted in resolving their “missing pieces” about labor/birth. These activities enable parents to be emotionally available to begin parenting their newborn. Parenting is “the working out of the discrepancy between the wished for and the actual child.”</td>
</tr>
<tr>
<td>• Ability to enter into a therapeutic relationship…or not</td>
<td>Maternal cognitive dissonance within the first 24 hours after birth. Comfort measure and pharmacologic interventions for maternal pain control.</td>
</tr>
</tbody>
</table>
Parent Education Prior to Discharge

and pleasure cries. The loud, lusty cry of the healthy term newborn is a sign of wellness and robustness, as well as a way of communicating needs. Environmental stressors such as noise, cold, light, overstimulation, multiple caregivers, or lack of synchrony may precipitate crying. Tension in the environment or caregiver may potentiate or contribute to an infant’s crying.

Development of a sense of trust occurs as the infant’s cries are responded to by parents who are able to meet the infant’s needs. More responsiveness by parents to an infant’s cries has been shown to result in diminished crying behaviors—the infant associates comfort with the parent. Prompt parental responses prevent escalation to out-of-control crying and quickly attended babies are easier to soothe. Consistent, prompt response does not “spoil” babies. Term infants develop a diurnal pattern of crying after birth—they cry more during the day than at night. As babies become older and more mature their crying decreases. Persistent crying (>3 hours a day) is more common in the breast-fed infant, while early evening crying is more likely in the formula-fed infant. Crying increases in the first 3 months of life, peaking at about 6–8 weeks of age, then decreasing significantly at around 3–4 months of age. Crying is irreversible crying without an obvious reason. It occurs in 10–20% of all infants, developing at about 2 weeks of age, and persisting for 4–5 months. Although the cause of colic is unknown, historically it has been attributed to GI or CNS disturbances, allergies or parental stress. Newer research attributes colic to normal neurodevelopmental changes in newborn infants. How parents interpret and respond to the infant’s crying is influenced by their understanding of the reason for crying and their knowledge of strategies to soothe their infant.

Box 2: Graduated Parental Interventions to Quiet a Crying Infant

- Gentle, soothing, high-pitched talking (loud enough for infant to hear over his/her crying).
- “Centering” the infant by placing the palm of the parent’s hand on the infant’s chest or holding baby’s arms over chest with palms of hands.
- Swaddling with blankets to calm self-startles.
- Picking up, holding infant (upright on shoulder is the most soothing position), and rocking.
- Placing infant skin-to-skin on parent’s chest.
- Offering a pacifier for nonnutritive sucking.
- Caregiving: feeding, burping, changing diapers, rocking, holding/carrying, massage.
- Decreasing stimuli: dim lights, decrease noise and activity.

Sleeping

Circadian rhythms in infants are influenced by genetic factors, brain maturation, and the environment. Following birth and for the first several weeks after birth, term infants distribute sleep over a 24-hour period, sleeping from 16–19 hours/day. As term infants go to sleep they enter active, rather than quiet sleep and spend more time in active sleep than adults. Active sleep cycles vary from 10–45 minutes and quiet sleep cycles last about 20 minutes. While adult sleep cycles are 90–100 minutes in duration, an infant’s sleep cycle lasts 50–60 minutes. At birth, infants have their own internal clock for sleep-wake, hunger, feeding and fussy times. The clock is often a continuation of intrauterine rhythms. Family disruption and conflict may result when the infant interferes with the family’s schedule of wakefulness and sleep. Maturation of sleep-wake cycles to coincide with the family’s rhythm occurs as a result of brain maturation and environmental influences. As the infant’s brain matures and the infant is exposed to patterned caregiving by parents, organization and stabilization of sleep-wake cycles occurs. For example, at 6 weeks postnatal age, infants are awake more during the daytime than at night; by 12 weeks more sleep occurs during the night than during daytime hours. By 4–6 months of age term newborns have the brain maturation, adequate stomach capacity and sufficiently mature circadian rhythms to sleep through the night.

Parents need to be shown how to position the baby for sleep and told the reason why the supine—on the back—is the proper position. The AAP position paper on infant sleep recommends that all healthy infants be placed only supine for sleep with a pacifier in the mouth. Sleeping in the same room, but not in the same bed with parents is also recommended. Side-lying for term infants is not recommended because they may spontaneously roll from side-lying to prone. Adoption of the “Back-to-Sleep” program has resulted in a 40% to 50% decrease in the rate of sudden infant death syndrome (SIDS). All care providers (including grandparents, childcare providers and babysitters) should sleep babies supine.

In healthy term infants, overheating, use of soft sleeping surfaces/bedding, stuffed toys, and positioning devices should also be avoided. Smoking is a risk factor for SIDS, as well as increasing the infant’s susceptibility to respiratory infections. Parents should be encouraged to stop smoking. If they continue to smoke, they should do so only outside of the house and car. (See Gardner SL: Sudden infant death syndrome (SIDS) and the sleep environment Nurse Currents 2009; 3:1. (Available at www.anhi.org).

Skin Care

Babies only need to be bathed 2–3 times/week, in water that is 100 degrees Fahrenheit, with a mild soap. Between tub baths, sponge bathing with water on face, folds and bottoms is adequate. Products to be used on the newborn’s skin should contain no/few additives such as fragrances, to reduce the incidence of contact sensitization. Minimal use of lotions and creams on newborn skin is best. Powders should not be used because of the risk of inhalation of talc into the baby’s lungs. Frequent changes of wet/soiled diapers, cleansing the diaper area and using diapers that wick the moisture away from the skin are usually sufficient to prevent diaper rash. If the infant’s skin becomes red and irritated with the use of disposable diapers, a change of diaper brands often solves the problem.

When diaper rash does occur, the use of protective barrier products such as zinc oxide will prevent further injury and allow skin to
Overdressing and overheating are the most common problems for newborn infants. Parents should be instructed to maintain the baby’s temperature between 36.5 and 37 degrees Centigrade…

heal. With each diaper change, waste should be cleaned from the skin, but the barrier product should not be removed, as this may disturb healing skin. Diaper dermatitis caused by yeast infection requires antifungal medication. Care of the circumcised male infant includes keeping the penis clean and observing for redness, foul odor or drainage. The uncircumcised penis should be kept clean and the foreskin should not be retracted.

The umbilical cord needs to be kept clean. The diaper should be turned back away from the intact umbilical cord until it separates, dries and falls off (within 7–10 days after birth). As the cord separates there may be some spots of blood on the baby’s diaper; this is normal and is similar to the slight bleeding that occurs as a scab separates from skin. If the umbilical cord becomes soiled with urine/stool it should be wiped with water. However, if a warm, red area of skin is seen around the base of the umbilical cord, or there is a foul odor or drainage from the cord, the baby’s healthcare provider needs to be called immediately.

Clothing and Dressing
Overdressing and overheating are the most common problems for newborn infants. Parents should be instructed to maintain the baby’s temperature between 36.5 and 37 degrees Centigrade (97.7–98.6 degrees Fahrenheit) with clothes, blankets and adequate environmental temperature.17 Prior to discharge, parents should be taught how to take an axillary (never a rectal) temperature. It should be explained to parents that when newborns go home, it is not necessary to raise the ambient temperature in the house because of the presence of an infant. A comfortable temperature for the family should be maintained, and the infant dressed accordingly. For instance, if the house is cool enough for adults and older children to wear sweaters, then the infant will also need more clothes to maintain his/her temperature in the normal range. Avoidance of overdressing and overheating is also associated with decreased risk of SIDS. A recent study showed that the presence of an oscillating fan in the room of a sleeping infant decreased the incidence of SIDS.19

Late preterm infants (34 0/7 to 36 6/7 weeks of GA) present a special challenge both in the hospital and after discharge. Because of their biologic and physiologic immaturity these preterm infants may have difficulty maintaining normal axillary temperature. After discharge the parents may need to use more clothing and blankets to assist these preterms in maintaining thermal neutrality. Failure to keep these infants sufficiently warm, if they are unable to regulate their own temperatures, results in their using calories for warmth instead of for growth. However, both professionals and parents must remember that there are other reasons why these infants may not be warm enough—including hypothermia due to sepsis. (See below)

The infant’s clothing, bedding and blankets should be washed in a mild detergent and rinsed twice to remove all soap residue. Dryer sheets and detergents with fragrances should be avoided; exposure of sensitive skin to chemicals may cause contact sensitization.

How to Recognize a Sick Baby23
Preventing infection is a vital part of parent education. Parents, siblings and all visitors must wash their hands prior to handling the baby. Contact with the infant should be restricted—no one with a “cold” or any infection should be around the baby. Crowds—large numbers of people with potential infections—should be avoided. Newly born babies should not go to shopping areas, children’s parties, childcare centers or church nurseries. For parents resuming work, child care settings with 1-2 children rather than many children will decrease exposure to illness.

Vaccination against influenza is recommended for all infants at 6 months of age, as well as their contacts.24 For infants at-risk for respiratory syncytial virus, the first dose of prophylaxis should be given prior to discharge, then monthly, according to published recommendations. (See Bolyard D: Respiratory syncytial virus: A seasonal occurrence requiring year-round planning Nurse Currents 2011; 5:2. (Available at www.anhi.org). Exposure to secondhand smoke must be avoided.

Recognizing an infected/septic newborn is difficult for professionals and even more difficult
for parents. Early recognition and treatment of septic infants is critical in improving morbidity and mortality rates. Prior to discharge, parents must be taught verbally and given written materials on how to recognize a sick newborn. Signs and symptoms of illness, how the infant acts and who to notify are important for all parents discharged with a newborn infant. This is especially critical for newborns with risk factors, such as late preterms, who are at increased risk for infections.

The World Health Organization conducted a large multi-site study of the clinical features and causes of bacterial disease in 0- to 6-day-old newborns and in 7- to 59-day-old infants. From an initial list of 20 signs and symptoms of neonatal illness, 7 were found to be independent clinical predictors of severe illness requiring hospital admission. The presence of any one sign listed in Box 3 indicates high sensitivity and specificity for severe illness. How Will I Know My Baby is Sick? is a useful tool that can be given to families at discharge to help them recognize illness in their infant. (See Parent Education Materials and Resources on the right.)

Box 4 lists common symptoms of infection in the neonate. Infected neonates have temperatures that are either too low or too high. Most often, the septic newborn becomes cold (hypothermic), rather than febrile (hyperthermic). Hyperthermia in the neonate can be due to sepsis—serious infection—or environmental causes such as overdressing and overheating. Changes in behavior, especially feeding behaviors, may be caused by infection.

Box 3: Signs and Symptoms Predictive of Serious Illness and the Need for Hospitalization in Infants from 0-6 days and 7-59 days of age

- History of difficulty feeding.
- Movement only when stimulated.
- Temperature <35.5 degrees Centigrade (95.9 degrees Fahrenheit).
- Temperature >37.5 degrees Centigrade (99.5 degrees Fahrenheit).
- Respiratory rate >60 breaths/minute.
- Severe chest indrawing (retractions).
- History of convulsions.

Box 4: Signs and Symptoms of Neonatal Infection

- Temperature instability: hypothermia or hyperthermia.
- Respiratory distress: tachypnea, apnea, grunting, flaring, retracting, cyanosis.
- Cardiovascular changes: tachycardia, bradycardia, hypotension, pallor, poor peripheral perfusion, capillary refill and weak pulses, decrease in urine output.
- Lethargy, irritability, seizures.
- Feeding abnormalities: vomiting, increased residuals, poor feeding, abdominal distention, diarrhea, GI bleeding.
- Jaundice: increase in direct and/or indirect bilirubin.
- Skin changes: purpura, petechiae, rash, erythema.
- Metabolic changes: acidosis (metabolic/respiratory or a combination), hypoglycemia, hypoxia.

Parent Education Materials and Resources

American Academy of Pediatrics: Parent Education Materials
- Care of the uncircumcised penis—Fact sheet
- Circumcision: information for parents
- Diaper rash
- Early arrival: information for parents of premature infants
- Infant sleep positioning and SIDS—Fact sheet


National Center for Shaken Baby Syndrome: www.dontshakes.org Thirty eight handout materials such as The Crying Card; Enjoy Your Baby brochures/ bookmarks; Understanding SBS brochure; Stay Calm bookmark; Three Things every Dad should know and Three things every Mom should know brochures.

Newborn Channel: www.newborn.com


Mothers, especially mothers of older children, should be instructed not to give a neonate any medication without calling the baby’s healthcare provider first. Mothers of toddlers who are familiar with giving sick older children...
anti-inflammatory medications may believe this practice is also advisable for a newborn. It must be emphasized that if a neonate is sick enough to be medicated, he/she is sick enough to be seen by a healthcare provider.

Bilirubin levels of late preterm infants peak later (at 5–7 days of life) and higher than those of term neonates. Late preterms are at higher risk for developing significant hyperbilirubinemia and 2-3 times more likely to be readmitted for treatment of their jaundice than more mature infants. Since hyperbilirubinemia may be a symptom of neonatal sepsis, both AWHONN discharge teaching guidelines and the AAP late preterm discharge criteria require professionals to assess for developing jaundice and screen every infant with age-appropriate nomogram prior to discharge. A follow-up appointment within 24–48 hours after discharge should be made and the importance of compliance should be stressed to the parents. They should also be taught the way to assess jaundice at home: evaluate in daylight, progress from head-to-toe, blanch skin, and, after the skin is blanched, note how far down the body the yellow coloring is visible.

Safety
Box 5 lists safety measures all parents of newborns must be taught prior to discharge.

Box 5: Safety Measures for Care of Newborn Infants

- Proper positioning for sleep: “Back-to-Sleep.”
- Proper use of car seats.
- Importance of a smoke-free environment.
- Safe nursery equipment.
- Never shake a baby!
- Written information about any medications parents will administer to infant.
- Cardiopulmonary resuscitation (CPR) instruction.

Car Seats
All states require infants to be restrained in car seats while riding in motor vehicles. Newborns may be discharged home only in a properly installed infant car seat. Demonstrate to parents how to properly position their infant safely in the car seat. Instruct them to limit the infant’s duration of travel, to closely observe the infant while sleeping, and to avoid using the car seat for infant sleeping. Since hyperbilirubinemia may be a symptom of neonatal sepsis, both AWHONN discharge teaching guidelines and the AAP late preterm discharge criteria require professionals to assess for developing jaundice and screen every infant with age-appropriate nomogram prior to discharge. A follow-up appointment within 24–48 hours after discharge should be made and the importance of compliance should be stressed to the parents. They should also be taught the way to assess jaundice at home: evaluate in daylight, progress from head-to-toe, blanch skin, and, after the skin is blanched, note how far down the body the yellow coloring is visible.

Shaken Baby Syndrome
It cannot be overemphasized to parents: never shake a baby! Frustrated parents who have no strategies to comfort a crying baby may shake the baby to stop the crying. The fragile brain of a baby bounces back and forth inside the skull causing bruising, swelling and bleeding. Of the infants who are shaken 80% suffer blindness, brain damage, developmental delays, seizures and/or paralysis; 25% of them die. The National Center on Shaken Baby Syndrome advocates three actions to prevent shaken baby syndrome: (1) Increase contact. Carry, walk and talk to the baby to reduce crying. (2) If crying becomes too frustrating, put the baby down in a safe place, walk away and calm down. (3) No matter what, never shake a baby.

Nursery Equipment
Newborns and infants depend on their parents and caregivers to provide them with a safe environment. Pillows, soft bedding such as quilts, comforters, sheepskins or bumper pads and soft objects like stuffed toys do not belong where the baby sleeps. Cribs should have no more than 2 3/8 inches between slats, have firm, tight-fitting mattresses, no missing or improperly installed hardware, no corner posts >1/16th inches high, and no cutouts on the head/footboard. According to the Consumer Protection Agency, drop-sided cribs have been associated with >30 infant deaths since 2000. As of June 28, 2011, drop-sided infant cribs are no longer manufactured, and the sale or donation of drop-sided cribs made prior to July 23, 2010 is prohibited. Babies should never be left unattended in a car seat, baby seat or swing. They should not sleep or spend excessive time in these devices. The seat can fall over, the infant can fall out of the seat and the baby’s breathing can be compromised because of slumping in the seats. Infants should never be left unattended on a flat surface without protective rails, or while bathing. Before changing, dressing or bathing the baby, all necessities should be immediately at hand. The unbreakable rule of infant care is: always have one hand on the baby. If what is needed cannot be reached while keeping one hand on the infant, the infant must be picked up and taken with the parent. Making the rule a habit prevents parents from walking away to retrieve a forgotten object or to answer the doorbell or phone. Every parent needs to know how to use a suction bulb to prevent choking and aspiration. At the hospital they can see, as well as practice its use. Most of all they should be taught when to use it, such as when the baby finishes feeding and suddenly vomits. If vomit is coming out of both nose and mouth demonstrate suctioning the baby’s mouth first, then the nose, explaining that the mouth holds a large amount of vomited milk. If the nose is cleared first, then newborns, who are nasal breathers, will take a breath immediately after their nose is cleared and aspirate all the vomit that was in their mouth. Vaporizers used in the nursery for babies with congestion should emit cool, not warm, mist to prevent thermal burns.

The microwave should not be used to warm either breast milk or formula. Microwave warming results in hot pockets within the liquid that can result in oral burns. Slow room-temperature warming of formula or breast milk is advised. Using room-temperature tepid water to mix powdered formula avoids potential burns.
additional danger of microwaving breast milk is the destruction of heat-sensitive anti-infective agents such as lysozyme and secretory IgA, which can result in overgrowth of bacteria in the milk.40-42

Sibling
Siblings, especially young siblings, do not understand that babies are fragile. They need parental help to interact safely with the new baby. Parents can teach the concept of “gentle” by using the word and showing the sibling how to touch and stroke the baby. Infants should never be left unattended with a young sibling. Parents should expect sibling rivalry and prepare for it.

Medications and Cardiopulmonary Resuscitation (CPR)
Generally, late-preterm and term neonates are not discharged from the hospital with medications. However, in the event that an infant is sent home with meds, the parents must be fully informed, verbally and in writing, about each medication, including name, action, dose, route, side effects and schedule for administering.

Because of time constraints parents of healthy term babies are not taught CPR as part of discharge teaching. However parents should be encouraged to take a CPR class offered by the American Red Cross, the hospital or a healthcare provider.4

Developmental Needs
Development occurs in an orderly sequence influenced by readiness, maturation, genetics and environmental influences. Although the sequence of development is the same in all children, the rate of development is individual. Therefore, within the range of normal development, differences between babies should be expected as an individual baby develops at his/her individual pace. At birth neonates are able to see within 8-10 inches of their face, recognize mother’s face and are able to follow an interesting face/object horizontally and sometimes vertically. During the last trimester of pregnancy, the fetus is able to hear parental voices and prefers these voices after birth. In 2012, an issue of Nurse Currents will discuss the sensory capabilities of the newborn.

Follow-up Care
Parents need to understand the importance of follow-up care after hospital discharge, whether at a clinic, physician’s office, or a home visit.4,7 Follow-up care within 24-48 hours after discharge is especially important for late-terms and newborns discharged within 12-24 hours of life.1,25,33,32

Parental Needs
In order to care for an infant, parents need to care for themselves. Their needs for rest, sleep, privacy and resumption of sexual relationship is necessary to help with the transition from a couple to a family.

Ask if anyone will be coming to help in the first weeks after delivery. Take note of not only the name of the person and the relationship to the family but the tone of voice in which this information is given. Ground rules should be set for the “helper.” These should include cooking, cleaning and shopping while the new mother rests and cares for herself and the baby. Helpers should not care for the baby while the new mother cooks, cleans, shops and plays hostess.

Because everyone wants to see the new baby, many new families have too much company. They are so busy with an endless stream of visitors that the new parents do not get enough sleep or privacy and soon become exhausted. Authorize families to tell those wanting to visit that the hospital nurse ordered all potential visitors to: (a) be certain they are well, not ill, (b) be prepared to wash dishes, do laundry, or run errands, (c) bring a covered dish that can be frozen, and, (d) stay a maximum of 30 minutes. Assign the task of “enforcer” to the father or significant other. “It is your responsibility to make sure that Mom, baby and you are getting enough rest and sleep. You may need to tell friends or family that they cannot visit because you are too exhausted.”

Since newborns and infants do not sleep through the night for the first 4-6 months, parents now have a 24 hour/day job. Exhausted, sleep-deprived parents are unable to be emotionally present for their infant. (Even adults in intensive care units can develop psychosis as a result of sleep deprivation.) Sleep deprivation may also result in depression and inadequate breast-milk supply. With both parents present affirm: “You have a 24 hour/day job. The number of hours of sleep that you missed during the night when you were awake with the baby must be recovered. So if you were up for 3 hours during the night, you need to get 3 hours of sleep sometime during the day.” This is especially important if the mother is breast feeding, and the father may not realize how much sleep she is missing.

Resumption of sexual relations after birth is now based on the woman’s comfort level and her emotional and physical readiness for intercourse. The gravid uterus involutes to a normal size by 6 weeks postpartum, so 6 weeks of abstinence was the traditional advice given to new mothers. However, this advice was never evidence-based and the latest edition of Williams Obstetrics states that “following an uncomplicated birth, a six-week abstinence from intercourse makes little sense. It can be safely resumed in as little as three weeks or when comfort can be maintained.”44

Breastfeeding does not provide contraception after birth. Even though monthly periods may not occur with breastfeeding, ovulation does occur. Without contraception a breastfeeding woman can become pregnant.45

Conclusion
Preparing parents to care for their newborn is the responsibility of maternal and neonatal nurses. Given the short period of time that most parents spend in the hospital after giving birth, adequately covering all the information that parents need is a challenge. Using creative strategies such as care-by-parents, small group classes, multimedia, written materials, and return demonstrations, may expedite the teaching
and learning process. Written and/or recorded materials that parents take home also provide a reference when they are in doubt about their baby’s care. Discharge parents with the phone number of the nursery, and encourage them to call at anytime “because there is always a nurse here, awake, and ready to assist you if you are worried or have questions about your baby.”

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Feeding competence is crucial prior to discharge of the high-risk neonate,\(^1\) the late-preterm newborn,\(^2,3\) the newborn discharged at less than 48 hours of life,\(^1\) and even for the well-term newborn.\(^4\) The ability to take in adequate fluids and calories is so important that many late-preterm and preterm infants need prolonged (days to weeks) lengths of stay until they master this skill.

Meeting the neonate’s nutritional requirements is vital to maintaining health and resisting disease and for building new body tissue (i.e., growth) during a critical period of brain growth. Nutrition is so central to a newborn’s life that a change in feeding behavior is one of the earliest signs of neonatal illness, such as hypoglycemia or infection.

Regardless of feeding method there are some principles of neonatal nutrition that apply to all neonates. In order to grow and gain weight, a late-preterm and term infant needs to consume 110-120 kilocalories/kilogram/day. Daily nutritional requirements of carbohydrates, fats and protein are listed in Table 1. By the 8th day of life, neonates begin to gain weight at the rate of ½-1 ounce/day or 20–30 grams/day. Thriving neonates and infants grow at a predictable rate. By 6 months of age, they have doubled their birth weight, by 1 year they have tripled their birth weight, and by 2 years of age they have quadrupled their birth weight.

Healthy term newborns awaken themselves to feed while late-preterms may need to be awakened to feed (discussed below). Breast-fed babies awaken and eat more often than formula-fed infants, but all infants need to be fed every 1½–4 hours around the clock. Feeding young babies is the major reason that parenting is a 24-hour/day job.

### Table 1: Daily Nutritional Requirements for the Neonate

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Percentage of Total Caloric Intake</th>
<th>Grams/Kg/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>40%-50%</td>
<td>12-14 g/kg/day</td>
</tr>
<tr>
<td>Fat</td>
<td>40%-52%</td>
<td>4.4-5.7g/kg/day</td>
</tr>
<tr>
<td>Protein:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term Neonate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm Neonate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30wkGA ELBW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&lt;27 wks GA; &lt;1000g)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


### Learning Objectives

Upon completion of this article, the reader should be able to:

- Identify adequate intake for a full-term baby in kilocalories/kilogram/day.
- Recognize three signs that a breastfed baby is getting enough milk.
- Teach three feeding criteria for discharge of a late preterm infant.
Feature: Nutrition Education for Parents Prior to Discharge

Allowing an infant to awaken and signal that he/she needs to eat is called “demand feeding,” and term, healthy newborns will demand to feed. An infant who has been demanding to feed and changes his behavior—becomes sleepy, doesn’t demand to eat, needs to be awakened to feed, is difficult to arouse to feed, falls asleep during feedings without having fed well, or sleeps through the night needs to be evaluated by a healthcare provider. Some parents want to feed their babies by the clock, or on a schedule, which may or may not work, especially if the baby is breastfed and sleepy. Generally, babies who demand their feedings do so in a predictable fashion, eventually meeting parental needs for a schedule and the ability to anticipate feeding. Parenting is eminently easier if the baby leads and the parents follow.

Swallowed air and the need for burping is more common in bottle-fed than breastfed infants. Breastfed infants can be burped between breasts, but no burping by the infant is not uncommon. Burping is necessary in bottle-fed babies at every ½ to 1 ounce, to remove swallowed air that may cause distension, discomfort and vomiting.

Helping parents distinguish between wet burps, regurgitation, and vomiting is important because new parents are poor judges of the type and amounts that their baby brings up. Wet burps, bringing up some feeding with a burp, is common and normal within the first 6 weeks of life.7 Regurgitation—vomiting of part of a feeding—is most frequently due to overfeeding. Forceful projectile vomiting, vomiting an entire feeding, vomiting as a new finding, or vomiting of blood or bile is abnormal. Parents should be instructed to call their baby’s health-care provider immediately if abnormal vomiting occurs. The infant should be examined to rule out gastric or intestinal obstruction, esophageal abnormality, newborn infection/sepsis or gastroesophageal reflux.

At discharge, or within the first several days of life, all newborns, both breast- and formula-fed, will be started on vitamin D supplementation. To prevent rickets, the American Academy of Pediatrics (AAP) recommends 400 international units of vitamin D/day beginning in the first few days of life.5 Because human milk contains <25 international units/liter of vitamin D, breastfed infants who are not supplemented with vitamin D or don’t have adequate exposure to sunlight, are at risk for rickets. For infants ingesting <1,000 ml/day of formula, supplementation of vitamin D is also necessary for prevention of rickets.5

Honey is contraindicated for infants in the first year of life.6 The gastrointestinal tract of infants and young children cannot kill the live Clostridium botulinum spores found in honey. When live spores infect infants and children, infantile botulism characterized by muscle weakness, paralysis, respiratory arrest and death, occurs.7 Strongly advise parents that honey should not be used on breast nipples, pacifiers, in mixing formula or in any solid foods for the first two years of life.

Breastfeeding

The AAP,8 Institute of Medicine9 and the US Surgeon General’s Blueprint for Action on Breastfeeding10 state that (1) all infants in the US should be breast fed, (2) “human milk is uniquely superior for infant feeding,”9 (3) “infants should be exclusively breast fed for 5 to 6 months”9 and (4) “breast feeding is the ideal method of feeding and nurturing infants.”10 Nationally, 75% of new mothers are discharged from the hospital breastfeed- ing their babies.11 However, rates of exclusive breastfeeding at 3 and 6 months, as well as any breastfeeding at 6 and 12 months remain lower than the Healthy People 2010 goals of 50% breastfeeding at 6 months and 25% breastfeeding at 1 year.11

Mothers are more successful with breastfeeding when they have a positive attitude about it, are confident in their ability, and have support from significant others (both professional and personal).12,14 Overwhelmingly, maternal perception of “not enough milk” is the major reason mothers abandon breastfeeding for both term and preterm infants.12,14 Therefore it is crucial to teach mothers simple ways to assess if their baby is getting enough breast milk (see Box 1). Notice that none of the indicators in Box 1 call for weighing the baby before/after feedings. This is work-intensive, requires equipment that is not usually available or convenient and may result in excessive and unnecessary worry in mothers of term, healthy babies.

From 2001–2005 I consulted with the Gerber company about their new electric pump. From the breastfeeding mothers in the research, I learned how important having this knowledge is to breastfeeding success. For various reasons, all mothers in the study used a breast pump and after using the prototype I consistently inquired if there were any breastfeeding issues.

Box 1: How to Determine if the Baby is Getting Enough Breast Milk

- Baby has alert, healthy appearance,
- Baby demands feeding—cries, roots, puts hand-to-mouth, sucks on hands/fingers—8 to 12 times/day,
- Baby seems satisfied after feeding. Goes to sleep, sleeps 1½ to 2 hours before demanding to feed again,
- Baby is able to drain breasts of milk:
  - Palpate breasts before nursing. Milk glands will be firm and full of milk,
  - Let-down reflex occurs,
  - After let-down, baby is able to drain the full breast in 5–15 minutes,
  - Palpate breasts after nursing. The milk glands are empty and cannot be felt.
- Baby is well hydrated and well nourished:
  - 8 to 10 wet diapers/day of pale, dilute urine,
  - Stools are yellow, soft/loose, seedy. Frequency from after every feeding, to once/week,
  - Mucus membranes are moist. Infant’s mouth feels wet/moist to the touch,
  - Beginning on 8th day of life, starts gaining weight from 1/2 to 1 ounce/day,
  - Meets weight gain goals: doubles birth weight at 6 months, triples birth weight at 12 months and quadruples birth weight at 24 months.

There is no correlation between time needed to complete pumping breast milk (about 15–20 minutes) and time for baby to drain full breast (5 to 15 minutes after let-down occurs).
with which I could help them. Many mothers stated that they did not know if their baby was getting enough milk. Not just first-time mothers, but experienced breastfeeding women of infants from 4 months to 10 months of age, made this statement. The indicators in Box 1 can reassure such mothers. Without even seeing the baby, it is possible to reassure a mother that her baby is getting enough milk.

For instance, in counseling the mother of a 4-month-old consider the following exchange.

“What did your baby weigh at birth?”
“Eight lbs.”

“What does your baby weigh now?”
“The last time she had her shots, she weighed 20 lbs.”

“Well since your baby weighed 8 lbs at birth, she should weigh 16 lbs at 6 months. But she is only 4 months old and already weighs 20 lbs. Your baby is getting plenty to grow on!”

Breastfeeding mothers who use a pump often compare the amount of pumping time to the amount of time it takes their baby to nurse. From this comparison they decide that the baby could not possibly be getting enough milk. There is no correlation between the amount of breast milk expressed while pumping and the amount of milk a mother actually lets down when her infant nurses at her breast. Even using a double-pump set-up, pumping milk takes 15–20 minutes to drain full breasts, while a breastfeeding baby is able to drain a full breast in 5–15 minutes after let-down occurs. Research shows that full-term breastfeeding babies are very efficient; they obtain 50% of their milk in the first 2 minutes, and 80%–90% by 4 minutes. Minimal milk is obtained in the first 4 minutes of sucking. A healthy breast-feeding baby is able to complete a feeding in 15–20 minutes; taking longer than this expends more calories than will be obtained in the feeding. During the first month of life, volume of feedings increases as do the intervals between feedings.

Infants should always be held for feeding. Bottles should never be propped with the infant left alone to feed from the propped bottle. The bottle nipple needs to be positioned so that milk fills the nipple and the baby will not be swallowing air instead of milk. The baby should be burped every ½ to 1 ounce, and at the end of the feeding.

Human milk and/or formula provide complete nutrition for most term infants till they are 4–6 months of age. Too early introduction of supplements/solids is not recommended. (See Gardner SL: Introduction of solids into the diet of infants Nurse Currents 2011; 5:11.)
Correct formula preparation is critical and must be taught. In the hospital, parents see nurses open a bottle of formula and may copy this behavior at home. Consider the following true—and tragic—incident:

An 18-year-old single mother finally took her set of twins home from the hospital after several months of NICU care. One week after discharge she returned to the Emergency Department with two sick infants. For one week she had been feeding them concentrated, undiluted formula; she had opened the can and poured the liquid into bottles, as the nurses had done. Because of the solute load and lack of free water, both of the infants were in renal shut down and they both died.

A recent study of children with failure-to-thrive found that most were not growing because they were not receiving adequate caloric intake for growth. In the neonatal/infant population inadequate calories may be the result of not feeding enough (amount), often enough (frequency), or not preparing formula properly. Some parents dilute liquid formula with more water or mix powdered formula with fewer scoops per ounce to stretch formula when money is tight. However, when infants receive fewer calories per ounce they fail to thrive during a critical period of brain growth. Teaching parents that formula preparation must be done exactly according to the manufacturer’s instructions is important. Powdered formula is not only cheaper per serving but more convenient than concentrated and ready-to-feed. It does not need refrigeration and can be mixed with tepid water one bottle at a time. Demonstrations and/or videos of how to prepare formula should augment verbal instruction. Do not assume that parents are able to read and follow either the English or Spanish written instructions for formula preparation on the side of the can.

How to handle formula is another important aspect of discharge teaching. Preparing bottles of formula from concentrate requires that all bottles be stored in the refrigerator, then warmed to room temperature by sitting the bottle in a pan of hot water. The temperature of the formula should be tested on the inside of the wrist prior to offering it to the baby. Microwaving formula is contraindicated because it results in uneven heating, creating hot spots that have burned infants’ mouths.

Reconstituted powdered formula and/or mixed liquid formula should only be prepared in a batch for 24 hours. Once mixed, formula should be refrigerated immediately, if not fed. Any remainder of a feeding should be discarded because bacteria can grow in the unused formula. Bottles, nipples and rings should be washed after every use in hot, soapy water or sterilized in the dishwasher. When parents have a clean city water supply, sterilizing water for formula preparation is unnecessary.

Late Preterm Infants

Regardless of whether breast or bottle is used for feeding late preterm infants, they are poor feeders. Wang’s retrospective chart review found that 76% of late preterm infants had poor feeding compared to 28.6% of full term infants. Late preterm infants are re-hospitalized more frequently for jaundice, feeding difficulties and dehydration. Developmental immaturity of the late preterm infant contributes to poor feeding skills because of (a) inability to coordinate suck/swallow/breathe, (b) inability to awaken for and demand feeding, and (c) inability to remain awake to feed effectively. However, poor feeding skills in this population of immature infants may also be a sign of infection/sepsis rather than developmental immaturity.

A late preterm, breastfeeding infant is at particularly high risk for the development of dehydration due to poor feeding, the development of significant hyperbilirubinemia, and the need for rehospitalization. Mothers of late preterm infants suffer delayed lactogenesis because their immature infant stimulates the breast so poorly that milk production is delayed. The Association of Women’s Health, Obstetrics and Neonatal Nurses’ late-preterm initiative recommends that parent teaching for discharge include the fact that these infants feed poorly and that they may sleep through feeds and need to be awakened to eat. In their 18 minimum criteria for discharge of late preterm infants, the AAP also has several recommendations related to feeding ability, assessment and follow-up care.

Although late-preterm infants have unique nutritional needs, there is no document that delineates what these needs are. There is also a paucity of research to support nutritional interventions for this at-risk group of infants. However, clinically we are still responsible for caring for the nutritional needs of this population. Specific strategies to manage breastfeeding difficulties for late preterm infants are published by Meier and Wight and available from the Supporting Preterm Infants Nutrition (SPIN) program. Wessel’s article (available at www.anhi.org) encourages the use of donor breast milk or nutritionally-supplemented premature formulas, supplemental breast pumping and awakening late preterms to feed during the night.

Conclusion

Babies are ready for discharge when their parents are ready to care for them. Professional mother-newborn nurses are in a key position to educate parents in the safe care of their baby. Through education, demonstration and provision of hands-on care, nurses empower parents to care for their newborns after discharge.

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