SECTION 3

3.4 FEEDING THE PREMATURE BABY

Full-term babies demonstrate the coordination of the suck–swallow–breathe skills at birth. Often it takes time for premature infants to learn these skills. Additionally, premature babies have smaller mouths and the muscles used for sucking may be weak. Eating is a lot of work for them and uses a lot of their energy. Oral feedings need to be efficient to preserve energy for growth and need to be safe to avoid aspiration.

Your baby will begin to show you that he or she is ready to start oral feedings. Some of these readiness cues include hands to mouth, sucking, visual signs of alertness, and signs of hunger or rooting. Your baby also may start waking on his or her own for care times. Once your baby shows these readiness signals, it is time to introduce oral feeds, by either breast or bottle.

In the beginning, your baby may take one entire feed orally, but need to be fed through the OG/NG tube for the next. It’s also possible that your baby will take part of the feeding by nipple, but be unable to finish and need to have the rest of the feed through the tube. Feeding by a tube is also known as “gavage feeds.” This is normal premature baby behavior and eventually your baby will orally feed the entire amount every time.

Your baby will feed best when wide awake. Making eye contact, but not distracting your baby by talking or rocking, may also improve his or her ability to take feeds by mouth. In time, your baby will take less time to get through the feeds as he or she grows stronger and better able to suck, swallow and breathe at the same time.

What to feed baby

1. Babies need breast milk or an infant formula with iron for the first year of life. A few babies need a nonlactose formula. This formula is often a soybean-based formula. It is used temporarily if your baby has intolerance to the regular infant formula (rare!) or following an illness with diarrhea. Soy formula should be used only when suggested by your doctor. If your baby is on any other special formula, we will help you make arrangements for obtaining the formula.

2. Babies should remain on breast milk or an infant formula through the first year of life.

3. Babies do not need cereal, juice or other baby foods until they are 6 months old. All their nutritional needs are met from breast milk or infant formula

Exceptions:

- Some infants are placed on feedings thickened with cereal by their doctor because of problems associated with reflux (spitting up when feedings come up from the stomach into the esophagus, which is the tube connecting the throat to the stomach). Reflux also may cause your baby to feed poorly because the esophagus becomes irritated.

- Some babies may take the largest amount of formula they should have and still be hungry. Try to wait until your baby is 4-6 months old before adding cereal. Again, discuss this with your doctor.
4. Formula comes in three forms, some of which has iron added: ready-to-feed liquid, concentrated liquid and powdered. Baby formula in all of these forms has 20 calories per fluid ounce, when prepared according to label directions.

**Ready-to-Feed Liquid (with Iron)**
- Available in 32-ounce and 8-ounce cans or disposable bottles in several sizes.
- Requires no addition of water and little preparation time.
- Requires refrigeration after opening can or bottles.
- Once opened, refrigerate and use within 24 hours.
- The most expensive of the three forms of formulas.

**Concentrated Liquid (with Iron)**
- Available in 13-ounce cans.
- 13 ounces of formula is mixed with 13 ounces of water.
- Important to correctly dilute formula with water as label directs.
- Must be refrigerated after opening can and diluting.
- Once mixed, refrigerate and use within 24 hours.
- Cost is in the middle price range for the three forms of formula.

**Powdered (with Iron)**
- Available in 1-pound cans.
- Follow directions on can to mix.
- Easy storage before and after can has been opened.
- Convenient for travel or home use.
- Important to correctly dilute formula with water as label directs.
- Opened powder can be used for up to one month.
- Once mixed, refrigerate and use within 24 hours.
- The least expensive form of the formulas.

All three types of formula will give the same nutritional value to the baby. Check with your baby’s doctor about boiling your water (usually not necessary if you are on city or county water supplies) and sterilizing bottles.

**Never add more water to make the formula last longer or make it stronger by adding less water. This could be very dangerous to your baby's health.**

5. With refrigeration, an opened can of liquid formula or a prepared bottle can be stored for 24 hours.

6. Wash the top of the can with hot soapy water, rinse and air dry before opening.

7. If your baby drinks part of a bottle, you can leave it out at room temperature and offer the remainder up to one hour later. Then throw out the remaining formula. Do not add formula to a partially finished bottle. Give your baby a fresh bottle each feeding.

8. Do not use prepared formula that has been out of the refrigerator longer than two hours.
Special formula
1. Babies with heart or breathing problems (bronchopulmonary dysplasia [BPD]), or who have growth problems, sometimes go home on higher calorie formula (24 calories per ounce). It may be available to be purchased, like regular baby formula, in a grocery or drug store in your community, or it may be available through the WIC program.
2. Special formulas should only be used at the direction of your baby’s doctor. The health team will help you get the special formula when needed.

How much to feed
1. The amount of formula will vary. While in the hospital your baby was probably fed very specific amounts of formula and increases were made in small amounts. Start with the amount your baby was fed in the hospital (or a little more) when you fill your bottles at home.
2. Your baby is ready to feed on demand. This means your baby can have as much as he or she wants as often as he or she wants (unless your baby’s doctor tells you otherwise).
3. Babies tend to eat what they want and need, then stop sucking. They fall asleep, thrust the nipple from their mouth and stop sucking when finished.
4. Most babies feed for about 20 minutes. Feedings should not last longer than 30 minutes.
5. Sometimes your baby will eat more than other times. Do not be concerned about small variations in amounts.
6. Many prematures go home on a three- to four-hour feeding schedule and change back to a two- to three-hour schedule during a rapid period of catch-up growth.
7. Your baby will eventually take up to 32 ounces of formula in a 24-hour period. This is the most formula your baby should be given daily.

Sleeping through feedings
1. It often takes several months after going home before your baby sleeps through the night.
2. If your baby sleeps through the night, enjoy your rest and do not wake him or her unless instructed otherwise.
3. During the daytime, you cannot let your baby go longer than four to five hours without feeding, especially if your baby was born premature.

When to feed baby
1. We favor a demand feeding schedule of frequent small feedings. The baby will give us cues when he or she is alert and ready to eat.
2. Feed the baby when he or she is hungry (the baby may cry, open his or her mouth and turn his or her head toward a stroked lip, wiggle, lay quietly awake and then become vigorously active or fussy or suck on his or her hand when he or she is hungry). Babies do not usually go more than five hours between feedings and some eat as often as every two hours.
3. Feed the baby the amount he or she wants. Babies are mostly self-limiting. They stop sucking when they have had enough.
4. Most premature babies eat six to eight times a day for several months after going home.
5. If changing diapers and holding your baby does not calm your baby, feeding may. Try it.
Offering the baby water
1. All the fluids and calories a baby needs, including water, are provided in the breast milk or formula.
2. Breast milk is the best source of calories and fluid to the growing premature baby.
3. Follow the advice of your baby’s doctor about offering water to your baby.

Increasing the feedings
1. As your baby grows and gains weight, he or she will need more breast milk or formula.
2. When your baby takes the entire bottle regularly and sometimes cries for more or continues to suck strongly, it may be time to increase his or her feeding. Your baby probably will limit himself or herself.
3. Place an extra ½ ounce of formula in the bottles if you are concerned. If your baby begins to spit, he or she may be overfed. Decrease the amount of the feeding.

Warming the breast milk or formula
1. Never microwave breast milk or formula as this can create hot spots.
2. Microwaving breast milk will destroy its nutritional composition and never should be done.
3. If your baby prefers warm milk, place the bottle in a cup of warm water.
4. Most babies are used to room-temperature formula when they go home.
5. Many babies will be happy to take their formula directly from the refrigerator. Others may enjoy it warmed. No one way is better – nor does one way cause crying and stomach upsets more than the other.
6. Babies are creatures of habit and often like things done the same way.

Using tap water
1. Some formulas need to be diluted 1-to-1 with water before feeding.
2. If you make one bottle at a time, you can use warm tap water from the faucet. City water supplies are safe. If you have a question about your water, call the health department.
3. If you have well water, boil it for 15 minutes or use distilled water until your baby is 6 months old.
4. If your water comes from a well, it needs to be tested by the health department for bacteria and contaminants. Do not use it for drinking unless it is safe.

Sterilizing bottles and nipples
1. Sterilization of bottles and formula is not routinely recommended if you:
   • Have reliable city water.
   • Wash the bottles and nipples in hot soapy water and rinse in hot water.
     Allow to air dry. Clean any dried formula out of the nipple and its opening.
   • Prepare one bottle at a time.
   • Refrigerate opened formula no longer than 24 hours.
2. Washing the bottles in a dishwasher will clean them.
**Holding baby for feeding**
1. Hold your baby in the crook of your arm watching his or her face. Some babies may fall asleep this way.
2. Premature babies often get comfortable and sleepy during the feeding.
3. Hold and cuddle your baby when you feed him or her.
4. You may need to hold the smaller premature baby on your lap directly facing you. Use one of your hands to support your baby’s head, neck and upper back, while keeping the head and neck midline. If the head rests forward on the chest, your baby may have trouble breathing. Your baby may try to straighten his or her head by throwing it backward to help in breathing. If your baby’s head is held too far back, this can cause difficulty in swallowing as well as breathing.
5. Make sure breast milk or formula fills the nipple during the entire feeding or your baby will swallow air. Swallowing air may lead to spitting, crying and stomach upsets in your baby.
6. Your baby may require some chin support until his or her muscles become strong enough to form a good seal around the nipple.
7. **Never prop the bottle** and do not leave baby alone to drink it. Your baby could choke. Always hold your baby during feedings.

**Burping the baby**
1. Your baby needs his or her back rubbed or patted during the middle of the feeding and again at the end, so he or she can burp any air he or she has swallowed.
2. Sit your baby in your lap so he or she leans slightly forward, supported with one hand. Rub or pat your baby’s back with the other hand.
3. Traditional over-the-shoulder burping works well, but a “wet” burp may also leave you with formula down your back.

**Pacifiers**
1. Babies have a strong need and desire to suck.
2. Some babies are satisfied by the amount of sucking done at feeding time, while others require more.
3. Most premature babies enjoy sucking on pacifiers. Pacifiers may be used to help calm your baby as well as for your baby’s own pleasure. It should also be used if your baby is tube feeding. This is called non-nutritive sucking.
4. Some premature babies will suck on their thumbs if their hand is placed by their mouth.
5. Pacifiers should never be tied around your baby’s neck because it could choke him or her.
6. Pacifiers should not be dipped in honey. Cases of infant botulism, a series type of poisoning, have happened in babies because of honey infected with the “bug.”
7. Only use a commercial pacifier – never use a homemade pacifier. Homemade pacifiers are dangerous. Never make a pacifier from a nipple and plastic collar or ring. Some babies can separate the nipple from the collar and choke on it.
8. A pacifier should fit your baby’s mouth – if it’s too long, it might gag your baby. It should be flat enough to fit the palate and mouth comfortably. Small pacifiers are available in stores. Your nurse will show you various pacifiers that are developmentally appropriate for the age of your baby.
9. Using a pacifier is not bad. Babies enjoy the sucking activity and outgrow the need for it later.
Other types of milk

1. Cow’s milk
   - Nutritionally unbalanced for babies under 12 months.
   - Contains too much protein for your baby’s developing kidneys.
   - Contains a higher level of minerals such as phosphorous, calcium and sodium than breast milk or commercial formulas.
   - Does not contain adequate amounts of vitamins C and E, copper, or iron.
   - Blood loss in stools due to cow’s milk is believed to be responsible for much of the iron deficiency anemia in infancy.

2. Skim, 1 percent and 2 percent milk
   - Have no place in the diet of infants under 2 years of age.
   - Supply too much protein and salt.
   - Do not provide enough fat, which carries the essential fatty acids and fat-soluble vitamins.
   - Do not provide baby’s caloric needs.

3. Raw milk
   - Does not contain adequate amounts of vitamins A, C and D and iron.
   - If not home pasteurized, may contain harmful bacteria.
   - Inspection does not guarantee safe raw milk.

4. Evaporated milk
   - Low in vitamin C, iron and fluoride.
   - Not recommended for infants under 12 months.

5. Condensed milk
   - High in sugar.
   - Not recommended for babies of any age.

Solids

1. For the first 12 months of life, the best diet is human milk or infant formula. This is the “corrected” age for prematures. (See Development section.)
2. After the first 6 months, formula should still remain the major source of nutrition. Solid foods can be introduced during this period.
3. Solid foods may be started around 6 months of age. Given too early, solid food may contribute to obesity, provide more salt than a baby’s system can easily handle or cause an early food allergy.
4. If your baby takes more than 32 ounces of formula in 24 hours for more than a week, your baby’s doctor may begin solids early.
5. Solid foods do not help your baby sleep through the night.
General guide for feeding baby throughout the first year *(Full-term newborn)*

1. **Birth to 4-6 months**
   - Breast milk or formula.
   - Amount will increase from 2-3 ounces to 6-8 ounces per feeding.
   - The number of feedings will go from six to eight to four to five per day as baby begins to sleep through the night.

2. **4-6 through 9 months**
   - Breast milk or formula should be the primary source of nutrition.
   - The amount will remain at 6-8 ounces per feeding.
   - The number of feedings will decrease to four to five a day.
   - Baby should start to drink some liquids from a cup.
   - Solid foods may be added to baby’s diet at 6 months.
   - Individual foods should be introduced one at a time to determine the baby’s tolerance of each food.
   - Cereal should be spoon-fed and not placed in the bottle.

3. **10 through 12 months**
   - Breast milk or formula should continue to be the primary source of nutrition.
   - The amount of formula will be about 6-8 ounces three to four times a day.
   - Solid foods introduced earlier should continue to be fed.
   - Additional foods such as cottage cheese, toast, soups and other soft table foods may be introduced.

Weight gain and growth

1. A healthy premature baby whose intake is good and who was the right size for the time he or she was born can be expected to grow at the same rate as a full-term baby of the same “corrected age.”
2. Normal size for age is usually reached at about 10 months after the time your baby should have been born.
3. The preschool child who was a very low birth weight baby (less than 1500 grams or 3½ pounds) may tend to be slender although normal height.
4. The very ill premature baby born with the appropriate weight may have very rapid catch-up growth at 6-9 months corrected age. If the growth continues, the baby’s size will continue to increase. If the growth slows, the child may remain small.
5. Your baby born small for his or her gestational age may tend to remain small during childhood.
6. Generally, babies gain approximately ½ to 1 ounce of weight daily. There may be some days when your baby does not gain weight at all, but will gain more the next day.
Feeding problems
1. Spitting
   - Premature infants tend to spit up more than term newborns. The “valve” or opening between the esophagus (structure that connects the mouth and the stomach) and the stomach is not tight, so he or she tends to spit up small amounts with feeding and burping.
   - If spitting becomes a serious problem and causes poor weight gain, your baby may be tested and treated for gastro-esophageal reflux (called G-E reflux or reflux).

2. Reflux (gastro-esophageal reflux or G-E reflux)
   - Reflux means formula comes up from the stomach into a part of the esophagus (tube that connects the mouth and stomach).
   - Reflux may cause vomiting or apnea (short periods when your baby does not breathe) or result in failure of your baby to gain weight.
   - If your baby has reflux, the doctor may recommend placing your baby on his or her stomach or right side after feeding, raising the head of the bed slightly, or thickening the formula with cereal.
   - Reflux usually slowly improves and finally disappears at 3-4 months corrected age in some babies and not until 9-12 months in others.
   - Some babies may require medication.

3. Colic
   - Colic is unexplained bouts of crying often with stomach fullness or stomach spasms. Your baby may stiffen his or her legs, scream loudly, and pass gas or vomit.
   - Colic frequently occurs at the same time of the day, typically during the evening hours.
   - The infant is not ill.
   - Colic generally lasts for up to 3 months corrected age.
   - This constant crying is one of the most trying of the common problems.
   - Changing the formula usually has no effect.
   - Colic is not caused by incorrect feeding methods.
   - Often no cause can be found. Some experts feel this crying is a way for baby to “let off steam” after a lot of stimulation throughout the day. Most likely, it may be due to you baby’s immature nervous system.
   - Suggestions that may help your baby include frequent burping, putting a warm towel or blanket under your baby’s stomach (be careful not to burn the baby), walking or rocking the baby, wrapping the baby warmly and snugly, laying the baby on his or her stomach, and keeping the baby in a quiet place (dim lights and low noise).
   - There are no drugs that cure colic. Drugs often prescribed for colic are supposed to relieve spasms of the intestinal muscles and are often sedatives. Often they do not work. We do not recommend using drugs with babies unless there is evidence they are safe and effective. If there were a miracle drug, we would use it.
   - There is no reliable cure but time and patience.

Call the doctor if...
1. Baby’s appetite suddenly decreases for several feedings and your baby seems uninterested in the breast or bottle.
2. Vomiting continues.
3. Vomiting is forceful.
4. Vomit is green.
Vitamins
1. If your baby is premature, the doctor may order extra vitamins.
2. Formula typically provides enough vitamins once your baby takes a quart (32 ounces) every day.
3. The usual dose of multiple vitamins is 1 cc or one dropper-full daily.
4. Mix vitamins in a little formula so they do not taste so strong.
5. Never give vitamins straight to your infant. The scent and flavor can literally take your baby’s breath away.

Iron
1. All babies need iron for proper brain growth and development.
2. Babies grow very fast during their first year and need iron to grow.
3. Without enough iron, babies may develop iron deficiency anemia (low blood count).
4. Premature infants who are bottle-fed are usually discharged from the hospital on formula with iron (iron fortified).
5. Iron in the formula is not the cause of colic, constipation or spitting up.
6. Some babies will be sent home on additional iron drops.

Vitamin D drops
If your baby is exclusively or partially breastfeeding, talk to your pediatrician about vitamin D supplement drops.

Vitamin D is an essential vitamin that helps your baby’s body absorb calcium for strong bones and teeth.

The American Academy of Pediatrics recommends using vitamin D supplements for exclusively or partially breast-fed babies because of low average levels of vitamin D in breast milk.

Fluoride
If you use bottled water or well water, talk to your pediatrician about fluoride supplementation.
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