



# Nutrition Supervision





# Infancy







# Infancy

## CONTEXT

Infancy is a period marked by the most rapid growth and physical development experienced throughout life. Infancy is divided into several stages, each of which is unique in terms of growth, developmental achievements, nutrition needs, and feeding patterns. The most rapid changes occur in early infancy, between birth and age 6 months. In middle infancy, from ages 6 to 9 months, and in late infancy, from ages 9 to 12 months, growth slows but still remains rapid.

During the first year of life, good nutrition is key to infants' vitality and healthy development. But feeding infants is more than simply offering food when they are hungry, and it serves purposes beyond supporting their growth. Feeding also provides opportunities for emotional bonding between parents and infants.

Feeding practices serve as the foundation for many aspects of family development (ie, all members of the family—parents, grandparents, siblings, and the infant—develop skills in responding appropriately to one another's cues). These skills include identifying, assessing, and responding to infant cues; promoting reciprocity (infant's responses to parents, grandparents, and siblings and parents', grandparents', and siblings' responses to the infant); and building the infant's feeding and pre-speech skills. When feeding their infant, parents gain a sense of responsibility, experience frustration when they cannot interpret the infant's cues, and develop the ability to negotiate and solve problems through their interactions with the infant. They also expand their abilities to meet their infant's needs.

## GROWTH AND PHYSICAL DEVELOPMENT

For infants to grow at appropriate rates, they need adequate calories and essential nutrients. Conversely, poor growth is an important indicator of nutritional inadequacy.

Immediately after birth, infants lose approximately 10% of their body weight because of fluid loss and some breakdown of tissue. They usually regain their birth weight within 7 days. Typically, infants double their birth weight by age 4 to 6 months and triple it by age 1. On average, infants gain 4 to 7 oz per week in the first 4 to 6 months and 3 to 5 oz per week from ages 6 to 18 months. Infants usually increase their length by 50% in the first year of life, but the rate of increase slows during the second half of the year. From birth to age 6 months, infants gain approximately 1 inch a month, and from ages 6 to 12 months, they gain about a half inch a month.

Growth rates of exclusively breastfed and formula-fed infants differ. Breastfed infants grow more rapidly during the first 6 months of life but less rapidly during the remainder of the first year.<sup>1-3</sup> Infants' growth depends on nutrition, perinatal history, genetic factors (eg, parental height, genetic syndromes, disorders), and other physical factors.

To meet growth demands, infants require a high intake of calories and adequate intakes of fat, protein, vitamins, and minerals. During the first year of life, breast milk, infant formula, or a combination of both provide 40% to 50% of calories from fat and are thus



important sources of calories, essential fatty acids, and fat-soluble vitamins. Fats should not be restricted during the first year of life.<sup>4</sup> For full-term infants, breast milk from a well-nourished mother offers enough vitamins and minerals, with the exception of vitamin D, during the first 6 months. Infants who are born at term usually have sufficient iron stores for 4 to 6 months. However, since breast milk contains very little iron, breastfed infants are at risk of iron deficiency by age 6 months and should receive an iron supplement beginning at age 4 months.<sup>5</sup> Ideally, mothers should exclusively breastfeed for a minimum of 4 months, but preferably for 6 months.<sup>6</sup> Formula, when correctly prepared and given in adequate volume, provides sufficient amounts of all nutrients, including vitamins and minerals. Complementary (solid) foods can be introduced between ages 4 and 6 months when the infant is developmentally ready. After age 6 months, solid foods aid in the development of appropriate feeding and eating skills for all infants and provide additional nutrients to meet the Dietary Reference Intakes for breastfed infants.

Significant developmental changes that occur in the first year of life have a profound effect on the way infants feed. Newborns are able to locate the mother's breast, latch onto the nipple, and suck to receive colostrum and then milk. At about age 4 to 6 months, infants are developmentally ready (ie, when the tongue thrust reflex [pushing food out of the mouth] is fading, their sucking reflex has changed to allow more coordinated swallowing, they can sit with support, and they have good head and neck control) to eat complementary foods. Over the next few months, they learn to chew and swallow, manipulate finger foods, drink from a cup, and ultimately feed themselves. In late infancy, infants' physical maturation, mastery of purposeful activity, and loss of newborn reflexes allow them to eat a wider variety of foods, including foods with different textures, than they were able to consume during early and middle infancy.<sup>7</sup>

As infants grow, their ability to consume a greater volume and variety of food increases. Thus newborns need small, frequent feedings, whereas older infants are able to consume more volume at one time and require fewer feedings. Newborns' digestive systems can effectively digest breast milk or specifically designed infant

formula. By age 3 months, an infant's digestive system has matured enough to allow the absorption of more complex foods.

For most infants, the first primary tooth appears at around age 6 months. Teeth erupt every few months, usually in right and left pairs alternating between the upper and lower jaws, and proceeding from the front of the mouth to the back. These first teeth, however, do not change how infants process food, because infants usually gum their food even if they have front teeth.

During infancy, the amount and type of physical activity that an infant engages in changes dramatically. At first, infants spend most of their time sleeping and eating. Activity begins with reflexes that promote the infant's survival. For example, the rooting reflex causes the infant to turn his mouth toward the breast or bottle and suckle. Over the next few months, these reflexes disappear, and infants slowly gain control over their movements. With increasing control comes more physical activity, including sitting up, rolling over, crawling, standing, and eventually walking.

Development is an individual process. Some infants sit earlier than others. Some walk as early as age 9 months, and others walk months after their first birthday. Although the order in which infants acquire motor skills is typically the same, the speed with which they acquire them is different. The ways infants are held and handled, the toys they play with, and their environments all influence their physical activity and motor skills development. Families that play with their infants, encouraging rolling, crawling, and then walking, are nurturing age-appropriate development.

## DEVELOPMENTAL ISSUES

Infants need a nurturing environment and positive feeding patterns to promote healthy eating habits, learn to eat a balanced diet of varied foods, and learn to eat in moderation.

During the first year of life, feeding the hungry infant helps him learn to trust that his needs will be met. For optimal development, newborns should be fed as soon as possible when they express hunger. Parents must be careful observers of the infant's behavior, so that they can respond. The suck-and-pause sequence in breastfeeding or infant-formula feeding and behaviors such

as making eye contact, opening the mouth, and turning to the parent are an infant's first communication with her parents. As infants become more secure in their trust, they can wait longer for feeding. Infants should develop feeding skills at their own rate.

Difficulties in early feeding evoke strong emotions in parents and can undermine parenting confidence and parents' sense of competency. Thus feeding difficulties must be addressed in a timely manner. Over time, parents become more skilled at interpreting their infant's cues and increase their repertoire of successful responses to those cues. As they feed their infant, parents learn how their actions comfort and satisfy.

Close physical contact between the infant and a parent during feeding facilitates healthy social and emotional development. A sense of caring and trust evolves, which lays the groundwork for communication patterns throughout life.

A healthy feeding relationship involves a division of responsibility between the parent and the infant. The parent establishes a safe and nurturing feeding environment and provides appropriate, healthy foods. The infant decides when and how much to eat. In a healthy infant-parent feeding relationship, responsive parenting involves

- Responding early and appropriately to the infant's hunger and satiety cues
- Recognizing the infant's developmental abilities and feeding skills
- Balancing the infant's need for assistance with encouragement of self-feeding
- Allowing the infant to initiate and guide feeding interactions

### BUILDING PARTNERSHIPS

Partnerships among health professionals, families, and communities are essential for ensuring that infants are well nourished and that parents receive guidance on infant nutrition and feeding. Health professionals can impact feeding decisions tremendously because they can provide parents with opportunities to discuss, reflect on, and decide on options that best suit their circumstances. As part of the guidance they offer, health professionals also can identify and contact community resources that help parents at each stage of their infant's development.

Health professionals are uniquely positioned to influence women in their decisions about whether to breastfeed. Health professionals should emphasize that breast milk is the ideal food for infants and should encourage breastfeeding whenever possible.<sup>6</sup> Breastfeeding provides infants with significant protection against a variety of infectious diseases, particularly in areas with poor sanitation and contaminated water and food supplies. Compared with formula-fed infants, breastfed infants have fewer and less-severe bacterial and viral diseases, including meningitis, gastroenteritis, otitis media, pneumonia, botulism, urinary tract infections, and necrotizing enterocolitis.<sup>6</sup> Even if the infant is breastfed for only a few weeks or months, the benefits are significant. Discussing the benefits of breastfeeding during prenatal care enables parents to make informed choices about whether and for how long to breastfeed their infant. Breastfeeding success is in large part dependent on health professionals' supportive attitudes, a hospital climate that is conducive to the initiation and maintenance of breastfeeding, and health professionals' awareness of the need for breastfeeding instruction and support.

Many hospitals, including those striving to meet the requirements of the World Health Organization and the UNICEF Baby-Friendly Hospital Initiative, are taking the following steps to promote and support breastfeeding<sup>8</sup>:

- Developing a written breastfeeding policy and communicating it to all health care staff
- Training staff members to ensure that they have the skills to implement the policy
- Educating pregnant women about the benefits and management of breastfeeding
- Initiating breastfeeding early
- Educating mothers on how to breastfeed and maintain lactation
- Limiting the use of any foods or beverages other than breast milk
- Having newborns stay in the mother's room
- Supporting mothers so that they can breastfeed their infants on demand
- Limiting the use of pacifiers
- Fostering breastfeeding support groups

Some workplaces are adapting to meet the needs of breastfeeding women. Certain employers offer longer breaks and a private setting for pumping

breast milk, refrigeration to safely store breast milk, and on-site child care so that mothers can breastfeed their infants during the workday.

Other nutrition resources may be available in the community. For parents, programs can focus on the importance of prenatal nutrition, the value and benefits of breastfeeding, and infants' nutrition needs. Health departments offer similar educational services through the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) and other programs in which community health nurses or nutritionists visit families at home. Health maintenance organizations and community hospitals may also offer infant nutrition education.

The community may also supply financial resources to families to ensure that infants are adequately nourished. WIC offers a food package for pregnant, postpartum, and breastfeeding women and for infants and children up to age 5 from families with low incomes. Federally funded nutrition assistance programs can provide a substantial part of a child's daily nutrition requirements. (See Tool K: Federal Nutrition Assistance Programs.) A community food shelf or pantry can provide additional food for families in need. In some cases, infants may benefit from access to human breast milk banks. Families may also need assistance in procuring special equipment, such as breast pumps, special nipples, and bottles.

### COMMON NUTRITION CONCERNS

Many parents need guidance from a health professional in deciding whether to feed their infant breast milk or infant formula. They want to be certain that their infant is receiving all the nutrients she needs, but they don't know whether breastfeeding or bottle feeding is best. Health professionals can help identify barriers to breastfeeding and provide referrals to lactation support services. Infants with special health care needs can be successfully breastfed, although mothers

may need extra emotional support, instruction about special techniques for positioning, or special equipment to help overcome feeding problems. (See the Breastfeeding chapter.)

Health professionals should be aware of lactation specialists available in the area; tell parents about the benefits of using these specialists, even for mothers who have breastfed before, and provide referrals as appropriate. In many cases, lactation specialists provide follow-up care after the mother and infant are discharged from the hospital, consult with the mother by phone, and schedule follow-up visits in a hospital-based lactation clinic. They also offer suggestions to health professionals for use during follow-up visits. Moreover, lactation specialists help families manage breastfeeding when mothers return to work or when breastfeeding needs to be interrupted because of severe illness in the mother or infant or for other reasons. Breastfeeding support groups, such as La Leche League, may be available in the community. (See Tool J: Nutrition Resources.)

Parents may also need help determining when to introduce solid foods into the infant's diet. Health professionals can provide information related to the infant's nutrition needs and developmental abilities. Infants are developmentally ready to eat solid foods between ages 4 and 6 months. Between ages 6 and 12 months, infants master chewing, swallowing, and manipulation of finger foods; begin to use cups and utensils; and try foods with different tastes and textures.

Infants with special health care needs may have feeding challenges that raise concerns for parents. Resources are available to provide education and support for parents of infants with such needs. For infants with developmental disabilities, nutrition problems may be addressed as part of nutrition therapy in an early intervention program. (See the Children and Adolescents With Special Health Care Needs chapter.)

# Nutrition Supervision

An infant's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. (For more information on health supervision, see *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, listed under Suggested Reading in this chapter.)

Health professionals begin nutrition supervision by selectively asking interview questions about the infant's nutrition status, to invite discussion and build partnerships. Use of the questions may vary from visit to visit and from family to family. Questions can be modified to match the health professional's communication style. Gathering information can also be accomplished by reviewing a questionnaire filled out by parents before the visit. (See Tool A: Nutrition Questionnaire for Infants.) Additionally, to meet the challenge of providing nutrition supervision to diverse populations, health professionals need to appreciate the variety of cultural traditions related to food and the wide variation in food practices within and among cultural groups. (See the Cultural Awareness in Nutrition Services chapter.)

These methods provide a useful starting point followed by screening and assessment to identify an infant's nutrition concerns. The accompanying anticipatory guidance should be geared to address the family's questions and nutrition concerns for that particular infant and family. Health professionals provide anticipatory guidance to parents to offer information on the infant's nutrition status, to make parents aware of what to expect as the infant enters the next developmental period, and to foster the promotion of healthy eating behaviors. (See Tool G: Strategies for Health Professionals to Promote Healthy Eating Behaviors.)

Nutrition supervision information that pertains to the entire infancy developmental period (Nutrition Supervision Throughout Infancy) is provided first, followed by information for age-specific visits. Interview questions, screening and assessment, and anticipatory guidance should be used as appropriate and will vary from visit to visit and from infant to infant.

## NUTRITION SUPERVISION THROUGHOUT INFANCY

### Interview Questions

- How do you think feeding is going for you and your baby? Do you have any questions about feeding your baby?
- How does your baby let you know when she is hungry? How do you know when she has had enough to eat?
- How often do you feed your baby?
- Does your baby receive anything else besides breast milk or infant formula?
- How do you feel about the way your baby is growing?
- Are you concerned about having enough money to buy food?
- What is the source of your drinking and cooking water? Do you use bottled or processed water?

### Screening and Assessment

- Assess the infant's growth. Measure the infant's length, weight, and head circumference, and plot these on a standard growth chart. Deviation from the expected growth pattern (eg, a major change in growth percentiles on the chart) should be evaluated. This may be normal or may indicate a nutrition problem (eg, feeding or eating difficulties, overfeeding).
- Evaluate the appearance of the infant's skin, hair, teeth, gums, tongue, and eyes.
- Assess the infant for age-appropriate development.
- Observe the parent-infant interaction, and assess parents' and infants' responses to one another (eg, affectionate, comfortable, distant, anxious).

### Anticipatory Guidance

#### FOR PARENTS OF ALL INFANTS

##### Growth and Development

- Inform parents that the infant needs fat for growth and energy and that they should not restrict the infant's fat intake during the first year of life.<sup>4</sup> Between ages 2 and 6 months, body fat increases twice as much as muscle;

therefore, many infants seem chubby at age 6 months. Girls deposit a greater percentage of fat than boys. Between ages 6 and 12 months, however, infants gain more muscle and less fat, reducing the appearance of chubbiness.

- Reassure parents that infants develop feeding skills at their own rates. The infant must be ready before being introduced to new foods and textures. If the infant has significant delays in the development of feeding skills, refer parents to a specialist for further assessment.

### *Feeding Practices*

- Tell parents that infants have special dietary needs because of their rapid growth and development.
- Inform parents that until the infant is age 12 months, breast milk or iron-fortified infant formula is recommended, and low-iron milk (eg, cow's, goat's, soy) should not be used, even in infant cereal.<sup>4</sup>
- Explain to parents that it is important to hold the infant close when feeding, in a semi-upright position, so that parents can assess the infant's cues of hunger, fullness, comfort, and distress. Parents should look into the infant's eyes during feeding.
- Emphasize to parents that breast milk is the ideal food for infants. Exclusive breastfeeding (only breast milk and prescribed medications offered to the infant) is recommended for a minimum of 4 months, but preferably for 6 months.<sup>6</sup>
- Instruct parents to feed the breastfed infant when he is hungry, typically 10 to 12 times per day during the initial weeks of life, 8 to 12 times per day for the next several months, and 6 to 12 times per day thereafter. Instruct parents to feed the formula-fed infant when she is hungry, typically every 3 to 4 hours (6–8 times per day) until complementary foods are added. For the younger infant (up to age 3 months), signs of hunger include putting his hand to his mouth, sucking, rooting, pre-cry facial grimaces, and fussing. For the older infant (ages 4–6 months), signs of hunger include moving her head forward to reach the spoon and swiping the food toward her mouth.

- Tell parents to feed the infant until he seems full. For the younger infant (age up to 3 months), signs of fullness include turning her head away from the nipple, showing interest in things other than eating, and closing her mouth. For the older infant (ages 4–6 months), signs of fullness include leaning back and turning away from the food.
- Reassure parents that it is normal for infants to spit up a little breast milk or formula at each feeding. Burping the infant several times during a feeding and avoiding excessive movement soon after a feeding may help. Encourage parents to burp the infant at natural breaks during feeding (eg, midway through the feeding) or after a feeding by gently rubbing or patting the infant's back while holding him against their shoulder and chest or while supporting him in a sitting position on their lap.
- Explain to parents that infants who are constipated (ie, who have hard, dry stools that are passed with difficulty) may not be getting enough breast milk or infant formula, may be receiving formula that is prepared incorrectly, or may be eating other foods too soon.<sup>4</sup>
- Instruct parents to introduce a cup for drinking at about age 6 months and to wean their infant from the bottle by age 12 to 14 months.
- Tell parents that juice should not be given to infants younger than 6 months. After age 6 months, provide 100% fruit juice in a cup instead of a bottle and limit it to 4 to 6 oz per day.<sup>9</sup>

### *Food Safety*

- Instruct parents that expressed breast milk can be stored in an insulated cooler bag for 24 hours, in the refrigerator for 5 days, in the freezer compartment of a refrigerator for 2 weeks, in a freezer compartment of the refrigerator with separate doors for 3 to 6 months, and in a chest or upright deep freezer for 6 to 12 months.<sup>10</sup>
- Tell parents that an open container of ready-to-feed or concentrated infant formula can be kept up to 48 hours, if tightly covered and immediately placed in the refrigerator. Formula that is prepared from powder and placed in bottles should be refrigerated and used within 24 hours.<sup>11</sup>

- Instruct parents not to warm expressed breast milk, infant formula, or any food in containers or jars in a microwave. Breast milk warmed in a microwave can easily overheat or may heat unevenly (because of hotspots caused by microwaving), burning the infant and destroying the milk's beneficial qualities. Bottles can be warmed by holding them under hot running water or placing them in a bowl of hot water for a few minutes. Frozen breast milk should be thawed slowly either at room temperature, in the refrigerator, or in a warm-water bath. To make sure that the fluid isn't too warm, parents can sprinkle a few drops on their wrist (it should feel lukewarm). If necessary, they can wait for it to cool down and test it again.
- Emphasize to parents that choking can be a problem for infants because they may not have enough muscle control to chew and swallow foods properly. Parents need to be aware that infants can choke on foods that are small or slippery (eg, hard candy, whole grapes, hot dogs) and foods that are dry and difficult to chew (eg, popcorn, raw carrots, nuts). Foods that are sticky or tough to break apart (eg, peanut butter, large chunks of meat) can get lodged in the throat. In addition to being choking hazards, these foods are not appropriate for infants.<sup>6</sup>
- Inform parents that infants are at high risk for many food-borne illnesses because their immune and gastrointestinal systems are not fully developed. To reduce the risk for food-borne illness, parents need to follow food-safety practices. (See Tool H: Basics for Handling Food Safely.)

### Supplements

- Explain to parents that breastfed and partially breastfed infants should receive a vitamin D supplement of 400 IU/day beginning in the first few days of life. Supplementation should continue unless the infant is weaned and is consuming at least 1 L/day or 1 qt/day of vitamin D–fortified formula or whole milk. Cow's milk should not be given to infants younger than 12 months.<sup>12</sup>
- Explain to parents that all non-breastfed infants who are ingesting less than 1 L/day or 1 qt/day of vitamin D–fortified formula should receive a vitamin D supplement of 400 IU/day beginning in the first few days of life.<sup>12</sup>

- Inform parents that although vitamin B<sub>12</sub> deficiency is rare, a breastfed infant may need vitamin B<sub>12</sub> supplements before age 6 months if the mother is vitamin B<sub>12</sub> deficient (eg, if she is a vegan [eats no animal products], if she is undernourished and does not take B<sub>12</sub> supplements).<sup>4</sup>

### Oral Health

- Instruct parents to clean the infant's gums with a clean, moist washcloth or a soft-bristled toothbrush with a small head, preferably one designed for infants, and plain water twice a day. Brush the infant's teeth with fluoridated toothpaste as soon as the first tooth erupts, usually around age 6 to 10 months, twice a day (after breakfast and before bed). (See the Oral Health chapter.)
- Tell parents to hold the infant while feeding and to never prop a bottle (that is, use pillows or any other object to hold the bottle in the infant's mouth).
- Explain to parents that dental caries (tooth decay) may result from frequent or prolonged feedings or snacking on sugary or carbohydrate-rich foods. Explain to parents that their infant should not be put to sleep with a bottle or sipper-type ("sippy") cup or allowed frequent and prolonged bottle feedings or use of a sippy cup containing beverages high in sugar (eg, fruit drinks, soft drinks, fruit juice), breast milk, or formula during the day or at night to prevent sugary fluids from pooling around the teeth, which can increase the infant's risk for dental caries (tooth decay).<sup>13</sup>
- Discuss with parents that their own oral health has an impact on their infant's oral health because parents can transmit caries-promoting bacteria to their infant. It is important for parents to visit the dentist regularly, limit foods and beverages high in sugar, and practice good oral hygiene (ie, brushing their teeth twice a day with fluoridated toothpaste and flossing once a day).<sup>13</sup>

### Physical Activity

- Discourage television viewing for children younger than 2, and encourage more interactive activities that promote proper brain development, such as talking and playing together.<sup>14</sup>

**FOR PARENTS OF BREASTFED INFANTS*****Feeding Practices***

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- Explain to parents that breastfeeding is recommended for infants during at least the first year of life because of its benefits related to infant nutrition, gastrointestinal function, host defense, neurodevelopment, and psychological well-being. (See the Breastfeeding chapter.)
- Tell parents that breastfeeding an infant exclusively for at least 4 months but preferably 6 months provides ideal nutrition and supports the best possible growth and physical development.<sup>6</sup>
- Inform parents that breastfeeding can continue for 12 months or as long as the mother and child wish to continue.<sup>6</sup>
- Explain to parents that breastfeeding can be more relaxing if the mother has a quiet place to breastfeed. The feeding position should be comfortable and the experience nurturing for the infant.
- Explain to parents that the longer an infant sucks, the more breast milk the mother's body will make. Feeding the infant on demand is the best way to stimulate lactation. Manually expressing breast milk or using a breast pump when the mother is away from her infant is recommended to increase or maintain the milk supply.
- Emphasize to parents that the infant should be allowed to finish feeding at one breast before the other breast is offered. The length of feedings should not be restricted, although 20 to 45 minutes per feeding generally provides adequate intake and allows the mother some time to rest between feedings.
- Inform mothers that infants typically need to be fed 10 to 12 times in 24 hours during the early weeks of lactation. Crying is a late sign of hunger that often interferes with good breastfeeding; the crying infant usually requires calming before breastfeeding can begin. In the first 2 to 4 weeks, infants should not be allowed to sleep more than 4 hours without breastfeeding.

- Explain to parents that infants have periods when they grow very fast. At these times, it may be necessary to feed them more often to give the mother's milk production a chance to adjust to the infant's needs. Frequent feedings help establish milk supply and prevent the breasts from getting too full.
- Instruct parents to introduce pureed meats that are rich in iron (eg, lean beef, pork, chicken, turkey) when complementary foods are introduced between ages 4 and 6 months to provide the infant with additional iron.<sup>4</sup>
- Emphasize to parents that an infant weaned from breast milk before age 12 months needs iron-fortified infant formula rather than cow's milk.<sup>6</sup>

***Maternal Eating Behaviors***

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- Tell mothers to eat a variety of healthy foods. Eating well helps the mother stay healthy and the infant grow. (See the Healthy Eating and Physical Activity chapter.)
- Encourage mothers to drink liquids such as milk or juice when they are thirsty and to drink a glass of water at every feeding.
- Tell mothers to limit the consumption of drinks containing caffeine (eg, coffee, tea, soft drinks) to 2 servings per day.<sup>15</sup>
- Explain to mothers that 8 oz of wine, 12 oz of beer, or 2 oz of hard liquor is safe if breastfeeding is then delayed for 2 hours.<sup>15</sup>

***Support***

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- Explain to mothers that additional sources of breastfeeding information include friends and family, breastfeeding support groups, lactation consultants, and educational materials.
- Encourage fathers to help care for breastfed infants. The father can bring the infant to the mother when it is time to breastfeed. When the infant is finished breastfeeding, the father can cuddle the infant and help with burping, diapering, or bathing.
- Emphasize that mothers who are breastfeeding more than one infant may need to eat more, receive additional nutrition counseling, and have extra help at home.

**FOR PARENTS OF FORMULA-FED INFANTS*****Feeding Practices***

- Explain to parents that iron-fortified infant formula is the recommended substitute for breast milk for feeding the full-term infant during the first year of life.<sup>4</sup>
- Explain to parents that they should not feed their infant cow's milk, goat's milk, soy milk, or low-iron formulas during the first year of life. Indications for use of soy-based formula include an infant fed a vegetarian diet or an infant with documented lactose intolerance.<sup>4</sup>
- Encourage parents to hold the infant close, in a semi-upright position, during feeding. The parent should be able to look into the infant's eyes.<sup>4</sup>
- Discuss with parents that they will need to prepare and offer more infant formula as the infant's appetite increases.
- Inform parents that infants do not usually need water, but water can be offered between feedings when the air temperature is high.<sup>4</sup>
- Instruct parents to check the following if the infant is crying more than usual or seems to want to eat all the time:
  - Is the infant placed in a semi-erect, comfortable position for feeding?
  - Is the formula prepared correctly? Has extra water been added?
  - Are parents responding to the infant's hunger cues?
  - Is the feeding environment too distracting?
- Tell parents not to enlarge the hole in the bottle nipple to make expressed breast milk or infant formula come out faster.
- If the infant is not feeding enough, parents should consult with a health professional.

***Food Safety***

- Tell parents to carefully prepare infant formula as instructed and to follow these sanitary procedures.<sup>11</sup>
  - Wash hands before preparing formula.
  - Clean the area where formula is prepared with a nontoxic biodegradable cleaner.
  - Clean and disinfect reusable bottles, caps, and nipples before every use.
  - Wash and dry the top of the formula container before opening.
- Emphasize to parents that cereal or other foods should not be added to infant formula.

- Tell parents to discard any formula left in the bottle when the infant has finished eating. A bottle that has been started should not be reused.<sup>11</sup>
- Inform parents that open containers of ready-to-feed or concentrated infant formula should be covered and refrigerated.<sup>11</sup>
- Inform parents that powdered infant formula can be stored at room temperature.

**NUTRITION SUPERVISION BY VISIT****PRENATAL*****Interview Questions*****FOR PREGNANT WOMEN**

- Are there any family health concerns that I should know about to better care for your baby and family?
- What was your pre-pregnancy weight? How much weight did you gain in prior pregnancies? How much weight have you gained until now?
- Tell me about your living situation. Do you have enough heat, hot water, and electricity? Do you have appliances that work?
- Do you have what you need to care for your baby? Do you feel comfortable caring for your baby? Do you have health insurance? Do you have enough money for food, clothing, diapers, and child care?
- Would you be interested in resources that would help you afford to care for yourself and your baby?
- Are you taking or do you plan to take prenatal vitamins? Are you taking other vitamins or minerals?
- Are you taking any prescribed or over-the-counter medications or pain relievers now, or have you taken any in the past?
- Have you used any special or traditional health remedies to improve your health since you have been pregnant?
- Do you drink alcohol or special teas, or take any herbs? Is there anything that you were taking but stopped using when you learned that you were pregnant?

- Are you using any other drugs (legal or illegal) or supplements?
- What are your plans for feeding your baby? What have you heard about breastfeeding? Do you have questions about breastfeeding?
- What kinds of experiences have you had feeding babies? With your own children? Other children? Your siblings?
- Are you restricting any foods in your diet because of lack of appetite, food aversions, vegan or vegetarian diets, weight gain, food allergies and sensitivities, or any other reason?
- Does anyone in your family have a history of food allergy or intolerance?
- What does your partner or family think about your plan for feeding?
- Do you have problems with your teeth? Does the water you drink contain fluoride?

#### FOR WOMEN PLANNING TO BREASTFEED

- Did you breastfeed your other children? How did that go?
- Do you have any worries about breastfeeding (eg, your diet, privacy, having enough breast milk, changes in your body)? Have you had any breast surgery?
- Have you been to any classes that taught you how to nurse your baby?
- Do you know anyone who breastfeeds her baby? Did any of your family or friends breastfeed? Would you be able to get help from them as you are learning to breastfeed?
- Do you know how to contact support groups or lactation consultants?

#### FOR PARENTS PLANNING TO FORMULA-FEED

- What have you read or heard about different infant formulas (eg, iron-fortified, soy, lactose-free)? Do you have any questions about formula feeding?
- Would you like help choosing formula for your baby?
- Are you worried about having enough money to buy infant formula?
- How do you plan to prepare the formula? What have you heard about formula safety?
- Do you have family members or friends who will help you feed your baby?

#### Anticipatory Guidance

- Explain to women the importance of maintaining health by going to all prenatal care appointments, getting enough sleep, and getting physical activity, as well as by eating healthy foods and gaining the right amount of weight.
- To minimize the risk for giving birth to an infant with a neural tube defect, encourage women to consume folic acid, particularly before pregnancy and during the first trimester of pregnancy. Before pregnancy, females should consume 400 µg per day of folic acid (the synthetic form of folate) from fortified foods and/or supplements in addition to consuming a variety of foods that contain folate. Once pregnancy is confirmed, recommended intake is 600 dietary folate equivalents per day of food folate, folic acid, or a mixture of both.<sup>16</sup>
- Inform women that concentrated sources of food folate include fruits (eg, oranges, strawberries, avocados); dark-green leafy vegetables (eg, spinach, turnip greens); some other vegetables (eg, asparagus, broccoli, brussels sprouts); and legumes (eg, black, pinto, navy, and kidney beans). Folic acid can be obtained from fortified food products (eg, fortified grain products, most ready-to-eat breakfast cereals).
- Tell women that resources are available to help them. They may be eligible for food, nutrition, or other assistance programs. Several federally funded nutrition assistance programs, such as the Commodity Supplemental Food Program and the Supplemental Nutrition Assistance Program, can help. (See Tool K: Federal Nutrition Assistance Programs.)
- Advise women planning for conception or who are pregnant to avoid consumption of alcoholic beverages because alcohol adversely affects fetal development.
- Encourage women to maintain good oral hygiene and obtain oral health care if needed. (See the Oral Health chapter.)
- Recommend to women moderate physical activity, such as gentle aerobics (eg, walking, swimming), as soon as possible after delivery to increase their energy level.
- Explain to women that weight loss after pregnancy should occur gradually by adjusting caloric intake, level of physical activity, or both.

**FOR PARENTS PLANNING TO BREASTFEED**

- Encourage parents to attend prenatal classes. In addition, many communities have lactation consultants and nurses who are available to assist with breastfeeding.
- Share information with women about the known effects on pregnant women of herbal or traditional health remedies. Explain that many herbal teas contain ephedra and other substances that may be harmful to the infant.
- Encourage mothers to consult with an obstetrician or another health professional about any herbal or traditional products that she is using.
- Assure women that most mothers are able to successfully breastfeed. Explain that infants with conditions that make breastfeeding challenging may still be breastfed and that a breastfeeding consultation and close monitoring can help.
- Inform mothers who plan to breastfeed or partially breastfeed that the infant will need a vitamin D supplement beginning in the first few days of life.<sup>12</sup>
- Emphasize to parents the need for a newborn visit with a health professional within 48 hours of discharge from the hospital to check the infant's feeding and weight status, monitor breastfeeding, and address questions and concerns.

**FOR PARENTS PLANNING TO FORMULA-FEED**

- Encourage parents to attend prenatal classes.
- Encourage parents to discuss the type of infant formula they plan to use and any proposed changes in formula.
- Review with parents the steps for preparing formula, and reinforce the need to carefully read the directions. Mixing directions differ among powdered formulas. Provide written information about how to safely prepare formula, including heating and cleaning bottles and nipples.
- Explain to parents that newborn infants who are formula-fed average 20 oz of formula per day. Tell parents to prepare 2 oz of infant formula every 2 to 3 hours at first and to then provide more if the infant still seems hungry.

**NEWBORN**

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

**Interview Questions****FOR PARENTS OF ALL INFANTS**

- How often does your baby feed? How long does it generally take for a feeding?
- How does he behave during a feeding? Pulls away, arches back, is irritable or calm?
- How does your baby behave after feedings? Satisfied baby look, still rooting, anxious?
- Has she received any other fluids from a bottle?
- How many wet diapers and stools does he have each day?
- Is anyone helping you feed your baby?
- What is the longest time your baby has slept at one time? How much rest are you getting?

**FOR PARENTS OF BREASTFED INFANTS**

- How is breastfeeding going for you and your baby?
- Do you need any help with breastfeeding?
- How often do you feed your baby? How do you know when he is hungry?
- How does your baby attach to your breast and suck? Do you hear her make swallowing sounds when you breastfeed?
- Have you had any problems with your breasts or nipples (eg, tenderness, swelling, pain)?
- Are you restricting any foods in your diet?
- What vitamin or mineral supplements do you take or plan to take? Is your baby receiving vitamin D supplements?
- Do you drink wine, beer, or other alcoholic beverages? Do you drink any special teas or take any herbs?
- Do you use any drugs (eg, prescription, over the counter, street drugs)?

**FOR PARENTS OF FORMULA-FED INFANTS**

- What formula are you using? Is the formula iron-fortified?
- How often do you feed your baby? How much does she take at a feeding?
- What questions do you have about infant formula (eg, brands, cost, preparation, amount)?

- How do you store the infant formula after you make it?
- How do you clean bottles, nipples, and other equipment?
- What do you do with the formula in the bottle after your baby has finished feeding?
- How does your baby like to be held when you feed him?
- Are you worried about having enough money to buy infant formula?

### Screening and Assessment

- Perform metabolic screening as indicated by the state.
- Assess administration of vitamin K.

### Anticipatory Guidance

#### FOR PARENTS OF ALL INFANTS

- Instruct parents on how to recognize an infant's hunger cues, which include putting her hand to her mouth, sucking, rooting, pre-cry facial grimaces, and fussing. Parents can avoid crying by responding to the infant's more subtle cues. Instruct parents to awaken the infant for feeding if she sleeps more than 4 hours at a time during the first 2 weeks.
- Inform parents that infants may be distracted by lights and noise and may need help to focus on feeding. A calm, gentle approach, using repetitive movements such as rocking, patting, or stroking, is usually most helpful. Some infants may need to be swaddled or fed in a room with less light and noise.

#### FOR PARENTS OF BREASTFED INFANTS

- Encourage women to begin breastfeeding as soon as possible after the infant is born, preferably in the delivery room.<sup>6</sup> (See the Breastfeeding chapter.)
- Instruct women to breastfeed when their infant shows signs of hunger (eg, increased alertness or activity, mouthing, rooting). Tell women not to wait until their infant is crying. Crying is a late sign of hunger that often interferes with good breastfeeding; the crying infant usually requires calming before breastfeeding can begin. Newborn infants usually are hungry every 2 to 3 hours and require about 8 to 12 feedings in 24 hours (throughout the day and night).<sup>6</sup>

- Reassure parents that breastfed infants are getting enough milk if they have about 6 to 8 wet diapers and 3 or 4 stools per day and are gaining weight at the appropriate rate.
- Tell parents to avoid using any artificial nipples (pacifiers, bottles) and supplements (unless medically indicated) until breastfeeding is well established. For most infants, this occurs around age 4 to 6 weeks.
- Encourage women who are considering combining breastfeeding and formula-feeding to wait until lactation is well established (usually at age 2–4 weeks) before introducing infant formula.

#### FOR PARENTS OF FORMULA-FED INFANTS

- Explain to parents that newborn infants who are formula-fed consume an average of 20 oz of formula per day. Tell parents to prepare 2 oz of infant formula every 2 to 3 hours at first and to then provide more if the infant still seems hungry.

### 3 TO 5 DAYS

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

### Interview Questions

#### FOR PARENTS OF ALL INFANTS

- How is feeding going? What questions or concerns do you have?
- How are you feeding your baby?
- How often does your baby feed? How long does it generally take for a feeding?
- How does your baby like to be held when you feed her?
- Are you comfortable that your baby is getting enough to eat?
- How does she behave during a feeding? Pulls away, arches back, is irritable, or calm?
- How does your baby behave after feedings? Satisfied baby look, still rooting, anxious?
- Has she received any other fluids from a bottle?
- Is anyone helping you feed your baby?
- How many wet diapers and stools does he have each day?
- What is the longest time he has slept at one time?

**FOR PARENTS OF BREASTFED INFANTS**

- How is breastfeeding going for you and your baby?
- Is your baby receiving a vitamin D supplement?
- Does your baby suck well? Does he latch on well and breastfeed in a rhythm?
- Do you feel a good “let-down” or “milk-ejection” reflex (tingling sensation and a strong surge of milk)?
- Have you noticed changes in your milk?
- How often does your baby nurse? How long do feedings last?
- How can you tell whether he is satisfied at the breast?
- Are you offering your baby breast milk in a bottle?
- What over-the-counter or prescription medications are you taking?

**FOR PARENTS OF FORMULA-FED INFANTS**

- What formula are you using for your baby? Is it iron-fortified?
- How are you preparing the formula?
- How often do you feed your baby? How much does she take at a feeding?
- How do you hold your baby while feeding? How do you hold the bottle?
- How do you know if your baby is hungry? How does she let you know she has had enough to eat?
- What questions do you have about infant formula (eg, brands, cost, preparation, amount)?
- What questions do you have about preparing formula and storing it safely?
- Are you worried about having enough money to buy infant formula?

**Screening and Assessment**

- Perform metabolic screening as indicated by the state.
- Assess the infant for milk intake, hydration, jaundice, and age-appropriate elimination patterns.
- If possible, observe the mother breastfeeding or either parent bottle-feeding the infant. Assess how comfortable the parent seems with feeding the infant, eye contact between the parent and the infant, the parent’s interaction with the infant, the parent’s and infant’s responses to distractions in the environment, and the infant’s ability to suck.

**Anticipatory Guidance****FOR PARENTS OF ALL INFANTS**

- Instruct parents on how to recognize an infant’s hunger cues, which include putting her hand to her mouth, sucking, rooting, precry facial grimaces, and fussing. Crying is a late sign of hunger that often interferes with good breastfeeding; the crying infant usually requires calming before breastfeeding can begin. Parents can avoid crying by responding to the infant’s more subtle cues. Instruct parents to awaken the infant for feeding if she sleeps more than 4 hours at a time during the first 2 weeks. Explain that keeping her close by will make it easier to recognize the early hunger cues.
- Inform parents that infants may be distracted by lights and noise and may need help to focus on feeding. A calm, gentle approach, using repetitive movements such as rocking, patting, or stroking, is usually most helpful. Some infants may need to be swaddled or fed in a room with less light and noise.

**FOR PARENTS OF BREASTFED INFANTS**

- Tell parents that at about age 1 week, the infant should settle into a more typical breastfeeding routine of every 2 to 3 hours in the daytime and every 3 hours at night, with one longer 4- to 5-hour stretch between feedings, for a total of 10 to 12 feedings in 24 hours.
- Inform parents that breastfed infants should have about 6 to 8 wet diapers in 24 hours after the mother’s milk comes in. Infants may have stools as frequently as one per feeding or may go for several days without a stool. Breastfed infants’ stools are loose. This is normal and is not diarrhea.
- Tell parents to avoid using any artificial nipples (pacifiers, bottles) and supplements (unless medically indicated) until breastfeeding is well established. For most infants, this occurs around age 4 to 6 weeks. Some infants never use pacifiers or bottles.

**FOR PARENTS OF FORMULA-FED INFANTS**

- Explain to parents that infants who are formula-fed average 20 oz of formula per day. Tell parents to prepare 2 oz of infant formula every 2 to 3 hours at first and to then provide more if the infant still seems hungry.

**BY 1 MONTH**

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

**Interview Questions****FOR PARENTS OF ALL INFANTS**

- How is feeding going? What questions or concerns do you have?
- What are you feeding your baby at this time?
- How often are you feeding him during the day? During the night?
- How do you know if he is hungry? How do you know if he has had enough?
- Have you given your baby anything other than infant formula?
- Have there been times when he seemed to be growing very fast and seemed to want to eat all the time? What did you do?
- Is anyone helping you feed him?
- How easily does your baby burp during or after a feeding?
- How many wet diapers and stools does your baby have each day?
- What is the longest time your baby has slept?
- Are you giving your baby any supplements, herbs, or vitamins?

**FOR PARENTS OF BREASTFED INFANTS**

- How is breastfeeding going for you and your baby?
- Do you need any help with breastfeeding?
- Are you breastfeeding exclusively? If not, what else is he getting?
- How often do you feed your baby? How long do you feed him each time?
- Does it seem as though your baby is breastfeeding more often or for longer periods?
- In what ways is breastfeeding different now from when you were last here?
- How can you tell if your baby is satisfied at the breast?
- Has your baby received breast milk or other fluids from a bottle?
- Are you planning to return to work or school? If so, are you pumping your breast milk? How do you store it? How long do you keep it?

**FOR PARENTS OF FORMULA-FED INFANTS**

- How do you hold your baby when you feed her?
- Do you ever prop a bottle to feed or put him to bed with a bottle?
- How is formula feeding going for you and your baby?
- What formula do you use? Is the formula iron-fortified?
- How do you prepare the formula?
- How often does your baby feed? How much does he take at a feeding?
- How long does it take to feed your baby?
- Have you given your baby anything other than formula?
- What concerns do you have about the formula (eg, cost, preparation, nutrient content)?
- What do you do with milk left in the bottle after he has finished eating?
- Are you worried about having enough money to buy infant formula?

**Screening and Assessment**

- If possible, observe the mother breastfeeding or either parent bottle-feeding the infant. Assess how comfortable the parent seems with feeding the infant, eye contact between the parent and the infant, the parent's interaction with the infant, the parent's and infant's responses to distractions in the environment, and the infant's ability to suck. Help the parents and the infant develop successful feeding behaviors. Assess the need for neurologic evaluation if the infant stiffens during feeding, continues to exhibit oral reflexes such as rooting, experiences delays in learning feeding skills, or has difficulty swallowing.
- For breastfed infants, determine whether the infant is receiving vitamin D supplements.

**Anticipatory Guidance****FOR PARENTS OF ALL INFANTS**

- Explain to parents that infants often go through growth spurts between ages 6 and 8 weeks and significantly increase their milk intake during that time. For formula-fed infants, parents will need to prepare and offer more infant formula as the infant's appetite increases.

- Emphasize to parents that infants should not be offered food other than breast milk or infant formula until they are developmentally ready (ie, when the tongue thrust reflex [pushing food out of the mouth] is fading, their sucking reflex has changed to allow more coordinated swallowing, they can sit with support, and they have good head and neck control).
- Inform parents that infants may be distracted by lights and noise and may need help to focus on feeding. A calm, gentle approach, using repetitive movements such as rocking, patting, or stroking, is usually most helpful. Some infants may need to be fed in a room with less light and noise. Feeding times offer a wonderful opportunity for social interaction between the infant and the parent.
- Tell parents that if the infant cries inconsolably for several hours each day and passes a lot of gas, he may have colic. If the infant is breastfeeding, short, frequent feedings are recommended.
- Suggest that parents play with the infant, encouraging her to follow objects with her eyes. Playing stimulates the nervous system and helps infants develop head and neck control and motor skills.

#### FOR PARENTS OF BREASTFED INFANTS

- Inform parents that their infant is getting enough milk if he has about 6 to 8 wet diapers and 3 or 4 stools per day and is gaining weight at the appropriate rate. The number of stools may decrease and, by age 6 weeks, breastfed infants may have stools as infrequently as every 3 days.
- Explain to parents that breastfed infants need a vitamin D supplement beginning in the first few days of life.<sup>12</sup>
- Tell parents that if they wish to introduce a bottle to their infant, they should pick a time when the infant is neither extremely hungry nor full. Suggest that someone other than the mother offer the infant the bottle. Tell parents to allow the infant to explore the bottle's nipple and take it in his mouth.

#### FOR PARENTS OF FORMULA-FED INFANTS

- Explain to parents that 1-month-old infants usually consume 24 to 27 oz of formula in 24 hours, but may consume 20 to 31 oz. Infants need to feed every 3 to 4 hours.

## 2 MONTHS

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

### Interview Questions

#### FOR PARENTS OF ALL INFANTS

- How is your baby's feeding going? What questions or concerns do you have?
- Tell me about all the foods you are offering your baby.
- Is anyone helping you feed her?
- What is the longest time your baby has slept?
- Have there been times when she seemed to be growing very fast and seemed to want to eat all the time? What did you do?
- How easily does your baby burp during or after a feeding?

#### FOR PARENTS OF BREASTFED INFANTS

- How is breastfeeding going for you and your baby?
- Do you need any help with breastfeeding?
- Are you giving your baby any supplements (eg, vitamin D)?
- Does your baby receive other foods or fluids besides breast milk?
- How often do you feed your baby? How long do you feed him each time?
- Does it seem like your baby is breastfeeding more often or for longer periods?
- In what ways is breastfeeding different now from when you were last here?
- How can you tell if your baby is satisfied at the breast?
- Has your baby received breast milk or other fluids from a bottle?
- Are you planning to return to work or school? If so, will you pump your breast milk?
- Does your school or workplace have a place where you can pump your milk in privacy? How will you store your milk? How long will you keep it?

#### FOR PARENTS OF FORMULA-FED INFANTS

- How is formula-feeding going for you and your baby?
- How are you preparing the formula?
- What formula do you use? Is the formula fortified with iron?

- How often does your baby feed? How much does she drink at a feeding?
- About how long does a feeding last? Have you offered her anything other than formula?
- How do you hold your baby when you feed him?
- Do you ever prop a bottle to feed her or put her to bed with a bottle?
- What do you do with formula left in the bottle after your baby has finished eating?
- Are you worried about having enough money to buy infant formula?

### Screening and Assessment

- Observe how responsive the parents and the infant are to each other (eg, gazing, talking, smiling, holding, cuddling, comforting, showing affection).
- If possible, observe the mother breastfeeding or bottle-feeding the infant. Assess how comfortable the parent seems with feeding the infant, eye contact between the parent and the infant, the parent's interaction with the infant, the parent's and infant's responses to distractions in the environment, and the infant's ability to suck. Help the parents and the infant develop successful feeding behaviors.
- For breastfed infants, determine whether the infant is receiving vitamin D supplements.

### Anticipatory Guidance

#### FOR PARENTS OF ALL INFANTS

- Explain to parents that as infants grow, they are more easily distracted during feeding and may need gentle, repetitive stimulation (eg, rocking, patting, stroking). Infants may need a quiet environment, perhaps with low lighting and without other people present. Feeding times offer a wonderful opportunity for social interaction between the infant and the parent.
- Tell parents that if the infant cries inconsolably for several hours each day and passes a lot of gas, he may have colic. If the infant is breastfeeding, short, frequent feedings are recommended.
- Emphasize to parents that infants should not be offered food other than breast milk or infant formula until they are developmentally ready (ie, at about age 4–6 months, when their sucking reflex has changed to allow coordinated swallowing, they can sit with support, and they have good head and neck control).

- Explain to parents that adding cereal to the infant's diet will not help the infant sleep through the night.
- Suggest that parents play with the infant, encouraging him to follow objects with his eyes. Playing stimulates the nervous system and helps infants develop head and neck control and motor skills. Tummy time should be encouraged because it promotes head control and appropriate gross motor development.

#### FOR PARENTS OF BREASTFED INFANTS

- Congratulate the mother for continuing to breastfeed!
- Emphasize to parents that breastfed infants continue to need 8 to 12 feedings in 24 hours (throughout the day and night). They may feed more frequently when they go through growth spurts. By age 3 months, breastfed infants generally feed every 2 to 3 hours but may have one longer stretch of 4 to 5 hours at night between feedings.
- Reassure parents that breastfed infants ages 6 weeks and older may have stools as infrequently as every 3 days.

#### FOR PARENTS OF FORMULA-FED INFANTS

- Explain to parents that 2-month-old infants usually consume 26 to 28 oz of formula in 24 hours, but they may consume 21 to 32 oz. Infants feed every 3 to 4 hours, with one longer stretch at night of up to 5 or 6 hours between feedings.

## 4 MONTHS

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

### Interview Questions

#### FOR PARENTS OF ALL INFANTS

- How is feeding going? What questions or concerns do you have?
- Tell me about what you are feeding your baby. How often are you feeding him?
- How much does she take at a feeding? About how long does a feeding last? Are you feeding your baby any foods besides breast milk or formula?
- Have you thought about when you will begin to give your baby solids?

- Does your baby seem interested in your food?
- Have you offered him foods from the family meal? If so, which ones?
- In addition to feeding her at home, where else is she fed (eg, at child care, at a relative's home)?

#### FOR PARENTS OF BREASTFED INFANTS

- How is breastfeeding going for you and your baby?
- In what ways is breastfeeding different now from when you were last here?
- How often does your baby breastfeed? About how long does a feeding last?
- Is your baby breastfeeding more often or for longer periods?
- How can you tell whether she is satisfied at the breast?
- Has she received breast milk or other fluids from a bottle?
- Are you giving your baby any supplements (eg, iron, vitamin D)?
- Are you planning to return to work or school? If so, are you pumping your breast milk? How are you storing pumped breast milk? How long do you keep it?

#### FOR PARENTS OF FORMULA-FED INFANTS

- How is feeding going? What formula are you using now?
- Is the formula fortified with iron? Have you tried other formulas?
- How are you preparing the formula?
- How often does your baby feed? How much at a feeding? How much in 24 hours?
- Has your baby begun to put his hands around the bottle?
- Are you still holding your baby for feedings?
- What do you do with infant formula left in the bottle when he has finished feeding?
- Have you offered your baby anything other than infant formula?
- Are you worried about having enough money to buy infant formula?

### Screening and Assessment

- For breastfed infants, determine whether the infant is receiving vitamin D supplements and whether the infant is receiving any iron-containing foods or supplements.

### Anticipatory Guidance

#### FOR PARENTS OF ALL INFANTS

- Explain to parents that infants can now clearly show when they are hungry (by moving the head forward to reach the bottle or spoon) or full (by leaning back and turning away from food). It is important to respond to the infant's behaviors for feeding to avoid overfeeding (which can cause spitting up) or underfeeding.
- Emphasize to parents that infants should not be offered food other than breast milk or infant formula until they are developmentally ready (ie, between ages 4–6 months, when the tongue thrust reflex [pushing food out of the mouth] is fading, their sucking reflex has changed to allow more coordinated swallowing, they can sit with support, and they have good head and neck control).
- Tell parents that there are no nutritional advantages to introducing solid foods before the infant is developmentally ready. However, there may be disadvantages (eg, overfeeding, improper balance of nutrients) to doing so.<sup>4</sup>
- Instruct parents to begin one single-ingredient new food at a time and not to introduce other new foods for 3 to 5 days to observe the infant for possible allergic reactions. Iron-fortified infant rice cereal appears to be one of the solid foods least likely to cause an allergic reaction.<sup>4</sup> (See the Food Allergy chapter.)
- Explain to parents that infants who are at high risk for developing allergies are those with at least one first-degree relative (parent or sibling) with allergic disease. Breastfeeding exclusively for at least 4 months or using hydrolyzed formulas may prevent or delay the occurrence of atopic dermatitis, cow's milk allergy, and asthma in infancy and early childhood.<sup>17</sup>
- Encourage parents to gradually introduce a variety of pureed or soft meats, fruits, and vegetables after cereals. The gradual introduction of a variety of foods, flavors, and textures<sup>18</sup> contributes to a balanced diet and helps promote healthy eating behaviors.<sup>4</sup>
- Encourage parents to talk to the infant during feedings. As infants develop, they increasingly respond to social interaction.

- Discuss with parents that their oral health has an impact on their infant's oral health because parents can transmit caries-promoting bacteria to their infant. It is important for parents to visit the dentist regularly, limit foods high in sugar, and practice good oral hygiene (ie, brushing their teeth twice a day with fluoridated toothpaste, flossing once a day).<sup>13</sup>
- Inform parents that infant toys encourage physical activity. Playing with safe, age-appropriate toys (eg, rattles, stuffed animals, plastic toys), moving them from hand to mouth, and sucking and gumming them helps infants develop skills they will use later when they begin to feed themselves.

#### FOR PARENTS OF BREASTFED INFANTS

- Congratulate the mother for continuing to breastfeed!
- Explain to parents that demand for more frequent breastfeeding is usually related to the infant's growth spurt and is nature's way of increasing breast milk supply. If an increased demand continues for a few days; is not affected by increased breastfeeding; and is unrelated to illness, teething, or changes in routine, it may be a sign that the infant is ready for solid foods.
- Instruct parents to continue vitamin D supplementation and if the infant is developmentally ready, offer good sources of iron such as iron-fortified, single-grain infant cereals (eg, rice cereal) and pureed meats, especially red meats, as the first solid food. They provide ample sources of iron, zinc, and protein, nutrients especially needed by breastfed infants.<sup>4,19,20</sup> One ounce (30 g) of infant cereal provides an infant's daily iron requirement, particularly if the infant is fed with foods rich in vitamin C, such as fruits, which enhances iron absorption from the cereal.
- Explain to parents that exclusively breastfed infants need iron (1 mg/kg of body weight/day) beginning at age 4 months and continued until iron-rich complementary foods have been introduced to prevent iron-deficiency anemia.<sup>5</sup>
- Explain to parents that partially breastfed infants (who receive more than one-half of their daily feeding from breastmilk) need iron supplement (1 mg/kg of body weight/day) beginning at age 4 months and continued until iron-rich complementary foods have been introduced to prevent iron-deficiency anemia.<sup>5</sup>

#### FOR PARENTS OF FORMULA-FED INFANTS

- Tell parents that 4-month-old infants usually consume 30 to 32 oz of infant formula in 24 hours, but they may consume 26 to 36 oz.
- Inform parents that vitamin supplements are not needed if the formula is iron-fortified and the infant is consuming an adequate volume of infant formula for appropriate growth.

### 6 MONTHS

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

#### Interview Questions

##### FOR PARENTS OF ALL INFANTS

- How is feeding going? What questions or concerns do you have?
- What are you feeding your baby at this time?
- Are you feeding her any food (liquid or solid) besides breast milk or formula?
- How often do you feed your baby?
- How much does she eat or drink? About how long do feedings last?
- Have you thought about when you will begin to give your baby solids?
- How are you planning to introduce solid foods, such as cereal, fruits, vegetables, meats, and other foods?
- How does your baby let you know when he likes a certain food?
- Has she eaten any foods from the family meal? If so, which ones?
- Has your baby fed himself anything?
- Does your baby have any favorite foods?
- What types of fluids is your baby getting in a bottle or cup?
- Do you know what your baby is fed when she is away from home (eg, at child care)?

##### FOR PARENTS OF BREASTFED INFANTS

- How is breastfeeding going?
- In what ways is breastfeeding different now from when you were last here?
- How often are you breastfeeding your baby? For how long on each breast?
- Does it seem like your baby is breastfeeding more often or for longer periods?
- How can you tell if your baby is satisfied at the breast?

- What are your plans for continuing to breastfeed?
- Has your baby received breast milk or other fluids from a bottle or cup?
- Have you given your baby any fluids other than breast milk, such as infant formula or cow's, goat's, or soy milk?
- Is your baby receiving vitamin D supplements?
- Is your baby receiving an iron supplement and/or iron-rich foods?

#### FOR PARENTS OF FORMULA-FED INFANTS

- How is formula-feeding going? What formula are you using now?
- Have you tried other formulas, or are you thinking of using other formulas?
- How often does your baby feed in 24 hours, and how much does he take at a feeding? Day feedings versus night feedings?
- Do you have any concerns about the formula (eg, cost, preparation, or nutrient content)?
- What kind of water is used to prepare the formula? Does the water contain fluoride?
- How are you preparing your formula?
- Are you worried about having enough money to buy infant formula?

#### Screening and Assessment

- For breastfed infants, determine whether the infant is receiving vitamin D supplements, and assess the need for iron supplementation.
- Ask whether the infant has had a dental visit.
- Assess eating behaviors to determine the infant's risk for dental caries (tooth decay). (See the Oral Health chapter.)

#### Anticipatory Guidance

##### FOR PARENTS OF ALL INFANTS

- Encourage parents to feed the infant when he is hungry. An infant shows hunger by moving his head forward to reach the spoon and swiping the food toward his mouth. He can indicate that he's full or doesn't want food by leaning back and turning away.
- Instruct parents to introduce solid foods when the infant is developmentally ready (ie, when the tongue thrust reflex [pushing food out of the mouth] is fading, his sucking reflex has changed to allow more coordinated swallowing, he can sit with support, and he has good head and neck control).
- Explain to parents that infants who are at high risk for developing allergies are those with at least one first-degree relative (parent or sibling) with allergic disease. Breastfeeding exclusively for at least 4 months or using hydrolyzed formulas may prevent or delay the occurrence of atopic dermatitis, cow's milk allergy, and asthma in early childhood.<sup>17</sup> (See the Food Allergy chapter.)
- Instruct parents to begin one single-ingredient new food at a time and not to introduce other new foods for 3 to 5 days to observe the infant for possible allergic reactions. Iron-fortified infant rice cereal appears to be one of the solid foods least likely to cause an allergic reaction.<sup>4</sup> (See the Food Allergy chapter.)
- Encourage parents to then gradually introduce other pureed or soft meats, fruits, and vegetables. The gradual introduction of a variety of foods, flavors, and textures<sup>18</sup> contributes to a balanced diet and helps promote healthy eating behaviors.<sup>4</sup>
- Instruct parents to use a spoon when offering the infant a new food.
- Emphasize to parents that if the infant does not like a new food, she should not be forced to eat it. The food can be offered at a later time. It may take 10 to 15 attempts before an infant accepts a particular food.<sup>21,22</sup>
- Tell parents that infants do not need salt, spices, or sugar added to their food.
- Inform parents that they can offer store-bought and home-prepared baby food, but infants who can feed themselves soft foods do not need pureed foods.
- Tell parents to serve only 100% fruit juice as part of a meal or snack. Serve juice in a cup, and limit it to 4 to 6 oz per day.<sup>9</sup>
- Explain to parents that a high chair allows the infant to be part of the family circle at mealtime, but a safety belt should be used to secure him.
- Encourage parents to talk to the infant during feedings. As infants develop, they increasingly respond to social interaction.
- Discuss with parents that it is best for families to drink fluoridated water; for families that prefer bottled water, a brand in which fluoride is added at a concentration of approximately 0.8 to 1.0 mg/L (ppm) is recommended.<sup>13</sup>

- Inform parents that by age 6 months, infants become very active and benefit from playing with toys for stacking, shaking, pushing, or dropping and from playing with others. Encourage parents to include the infant in family play.

#### FOR PARENTS OF BREASTFED INFANTS

- Congratulate the mother for continuing to breastfeed!
- Emphasize to parents that at age 6 months, breast milk (together with solid foods) remains the best source of nutrition for infants. Encourage the mother to continue to breastfeed for the first year of the infant's life and for as long thereafter as she and the child wish to continue.
- Instruct parents to continue vitamin D supplementation and to offer good sources of iron such as iron-fortified, single-grain infant cereals (eg, rice cereal) and pureed meats, especially red meats, as the first solid foods. They provide ample sources of iron, zinc, and protein, nutrients especially needed by breastfed infants.<sup>4,19,20</sup> One ounce (30 g) of infant cereal provides an infant's daily iron requirement, particularly if the infant is fed with foods rich in vitamin C, such as fruits, which enhances iron absorption from the cereal.
- Explain to parents that if a breastfed infant is unable to consume sufficient iron from dietary sources after age 6 months, elemental iron (1 mg/kg/d) can be used to prevent iron-deficiency anemia.<sup>5</sup>
- Explain to parents that exclusively breastfed infants need iron supplement (1 mg/kg of body weight/day) until iron-rich complementary foods have been introduced to prevent iron-deficiency anemia.<sup>5</sup>
- Explain to parents that partially breastfed infants (who receive more than one-half of their daily feeding from breast milk) need iron supplement (1 mg/kg of body weight/day) beginning until iron-rich complementary foods have been introduced.<sup>5</sup>

#### FOR PARENTS OF FORMULA-FED INFANTS

- Instruct parents to continue to feed the infant when she shows signs of hunger, usually 5 to 6 times in 24 hours.
- Inform parents that vitamin supplements are not needed if the formula is iron-fortified and the infant is consuming an adequate volume of formula for appropriate growth.
- Explain to parents that community water fluoridation is a safe and effective way to significantly reduce the risk for dental caries (tooth decay) in infants. Infants ages 6 months and older who receive infant formula prepared with water that is severely deficient in fluoride (<0.3 ppm) may require fluoride supplementation.<sup>13</sup> (See the Oral Health chapter.) Encourage parents to check with their local health department for information about community fluoride levels.

### 9 MONTHS

Health professionals should use the general information in the section Nutrition Supervision Throughout Infancy (pages 25–29), as well as the age-specific information that follows.

#### Interview Questions

##### FOR PARENTS OF ALL INFANTS

- How has feeding been going? What questions or concerns do you have?
- Who feeds your baby?
- When does your baby have something to eat or drink? How much does she eat or drink at a time?
- Is your baby drinking less breast milk or infant formula?
- Is your baby interested in feeding herself? What is she feeding herself?
- What does your baby eat with his fingers? Has he used a cup?
- Is your baby interested in the food you eat?
- What does your baby do when she has had enough to eat?
- Do you know what your baby eats when he is away from home (eg, at child care)?

**FOR PARENTS OF BREASTFED INFANTS**

- What are your plans for continuing to breast-feed? How often does your baby breastfeed? How long do you feed her each time?
- How is your milk supply?
- Is your baby receiving vitamin D supplementation?
- Has your baby had infant formula or cow's, goat's, or soy milk?
- Is your baby receiving an iron supplement and/or iron rich foods?

**FOR PARENTS OF FORMULA-FED INFANTS**

- How is formula-feeding going? What formula are you using now?
- How often does your baby feed in 24 hours? How much does he take at a feeding? Day feedings versus night feedings?
- How are you preparing infant formula for your baby?
- What kind of water is used to prepare the formula? Does the water contain fluoride?
- Do you have any questions about weaning your baby from the bottle?
- Are you worried about having enough money to buy infant formula?

**Screening and Assessment**

- Recommendations for iron-deficiency anemia screening have been put forth by the American Academy of Pediatrics (AAP) and the Centers for Disease Control and Prevention (CDC). (See the Iron-Deficiency Anemia chapter.) The AAP and CDC recommend screening infants during the first year of life.<sup>5,23</sup> While the AAP recommends universal screening for all infants for iron deficiency and iron-deficiency anemia at about age 12 months,<sup>5</sup> the CDC recommends screening infants at high risk for iron-deficiency anemia or those with known risk factors for iron-deficiency anemia at ages 9 to 12 months.<sup>23</sup>
- Infants considered at high risk for iron-deficiency anemia include<sup>23</sup>
  - Infants from families with low incomes
  - Infants who are eligible for WIC
  - Infants who are migrants or recently arrived refugees
  - Infants and children who are Mexican-American<sup>5</sup>

- Infants who have known risk factors for iron-deficiency anemia include<sup>23</sup>
  - Infants born preterm or with low birth weight
  - Infants fed non-iron-fortified infant formula for more than 2 months
  - Infants fed cow's milk before age 12 months
  - Infants who are breastfed and do not receive adequate iron from supplemental foods after age 4 months<sup>5</sup>
- Screen the infant for lead exposure. (See Tool E: Screening for Elevated Blood Lead Levels.)
- For breastfed and partially breastfed infants, determine whether the infant is receiving vitamin D supplements, and assess the need for iron supplementation.

**Anticipatory Guidance****FOR PARENTS OF ALL INFANTS**

- Explain to parents that the time between the introduction of solid foods and age 9 months is a sensitive period for learning to chew.<sup>24,25</sup> Exposing the infant gradually to solid textures during this time may decrease the risk for feeding problems, such as rejecting certain textures, refusing to chew, or vomiting. It may take 10 to 15 attempts before an infant accepts a particular food.<sup>21</sup>
- Tell parents that as their infant becomes more independent in feeding herself, parents are responsible for providing a variety of nutritious foods, and the infant is responsible for deciding how much to eat.
- Explain to parents that beginning at age 6 to 9 months, infants show more interest in the food their parents eat and less interest in breastfeeding or bottle-feeding. Nevertheless, infants should receive breast milk, infant formula, or both through the first year of life.
- Instruct parents to offer soft, moist foods (eg, mashed potatoes and other soft cooked vegetables, spaghetti with sauce, rice, tuna) as the infant gradually moves from gumming to chewing foods.
- Explain that as the infant gains more control over picking up and holding food, small pieces of soft foods can be offered.
- Encourage parents to be patient and understanding as the infant tries new foods and learns to feed himself.
- Encourage parents to remove distractions so that the infant stays focused on food.

- Explain to parents that a high chair allows the infant to be part of the family circle at mealtime, but a safety belt should be used to secure her.
- Encourage parents to let the infant drink from a cup with assistance.
- Tell parents to serve only 100% fruit juice as part of a meal or snack. Serve juice in a cup, and limit it to 4 to 6 oz per day.<sup>9</sup>
- Tell parents to avoid feeding the infant sweetened beverages, such as sodas and fruit drinks. These beverages contain calories but few or no nutrients.
- Explain to parents that most 9-month-olds are on the same eating schedule as the family: breakfast, lunch, and dinner. Instruct parents to give the infant snacks midmorning, in the afternoon, and in the evening.
- Instruct parents to be aware of what and how much their infant is fed while the infant is away from home.
- Discuss with parents that it is best for families to drink fluoridated water; for families that prefer bottled water, a brand in which fluoride is added at a concentration of approximately 0.8 to 1.0 mg/L (ppm) is recommended.<sup>13</sup>
- Explain to parents that some infants are crawling by age 9 months and may begin to walk by holding onto furniture. Warn parents never to put the infant in a walker because of the risk for severe injury or death. Parents can physically support the infant as she plays and explores her newfound strength and agility.
- Explain to parents to begin feeding the child whole milk at age 1. Reduced-fat milk (2%) is recommended for children ages 1 to 2 for whom obesity is a concern or who have a family history of obesity, dyslipidemia, or cardiovascular disease.<sup>26</sup>

#### FOR PARENTS OF BREASTFED INFANTS

- Congratulate the mother for continuing to breastfeed!
- Tell parents that, at age 9 months, breast milk (along with solid foods) continues to be the infant's best source of nutrition. Encourage the mother to continue breastfeeding through the first year of the infant's life, or for as long as the mother and the child wish to continue.
- Explain to parents that partially breastfed infants (who receive more than one-half of their daily feeding from breast milk) need iron supplement (1 mg/kg of body weight/day) beginning until iron-rich complementary foods have been introduced to prevent iron-deficiency anemia.<sup>5</sup>

#### FOR PARENTS OF FORMULA-FED INFANTS

- Instruct parents to continue to feed the infant when she shows signs of hunger, usually 5 to 6 times in 24 hours.
- Inform parents that vitamin supplements are not needed if the formula is iron-fortified and the infant is consuming an adequate volume of formula for appropriate growth.
- Explain to parents that community water fluoridation is a safe and effective way to significantly reduce the risk for dental caries (tooth decay) in infants. Infants ages 6 months and older who receive infant formula prepared with water that is severely deficient in fluoride (<0.3 ppm) may require fluoride supplementation.<sup>13</sup> (See the Oral Health chapter.) Encourage parents to check with their local health department for information about community fluoride levels.

The desired outcomes for the infant and the role of the family outlined in Table 1 can assist health professionals in promoting optimal nutrition.

**TABLE 1. DESIRED OUTCOMES FOR THE INFANT, AND THE ROLE OF THE FAMILY**

	<b>Educational/Attitudinal</b>	<b>Behavioral</b>	<b>Health</b>
<b><i>Desired Outcomes for the Infant</i></b>	<ul style="list-style-type: none"> <li>Has a sense of trust</li> <li>Bonds with parents</li> <li>Enjoys eating</li> </ul>	<ul style="list-style-type: none"> <li>Breastfeeds successfully</li> <li>Bottle-feeds successfully if not breastfeeding</li> <li>Consumes supplemental foods to support appropriate growth and development</li> </ul>	<ul style="list-style-type: none"> <li>Develops normal rooting, sucking, and swallowing reflexes</li> <li>Develops fine and gross motor skills</li> <li>Grows and develops at an appropriate rate</li> <li>Maintains good health</li> </ul>
<b><i>Role of the Family</i></b>	<ul style="list-style-type: none"> <li>Bonds with the infant</li> <li>Enjoys feeding the infant</li> <li>Understands the infant's nutrition needs</li> <li>Acquires a sense of competence in meeting the infant's needs</li> <li>Understands the importance of a healthy lifestyle, including healthy eating behaviors and regular physical activity, to promote short-term and long-term health</li> </ul>	<ul style="list-style-type: none"> <li>Meets the infant's nutrition needs</li> <li>Responds to the infant's hunger and fullness cues</li> <li>Holds the infant when breastfeeding or bottle-feeding, and maintains eye contact</li> <li>Talks to the infant during feeding</li> <li>Provides a pleasant feeding environment</li> <li>Uses nutrition programs and food resources if needed</li> <li>Seeks help when problems occur</li> </ul>	<ul style="list-style-type: none"> <li>Maintains good health</li> </ul>

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# Successfully Introducing Solid Foods

John Matthews is a 6-month-old infant who has been fed only breast milk. He is 27.5 inches long and weighs 19 lbs 13 oz. Both his length and weight have been between the 75th and 90th percentiles since he was 2 months old. Lately, his appetite appears to have increased. John's family does not have any history of allergies.

At the health clinic, John's mother tells Liz Roberts, the registered dietitian, that her son seems to want to breastfeed all the time, and she wonders whether it would be all right to add some solid foods to his diet. The dietitian confirmed that John has good head and neck control and can maintain a sitting position with little or no assistance. His sucking pattern has changed from the weaker, up-and-down movements of early infancy to stronger, back-and-forth movements. He is able to grasp objects that are placed within his reach, and he brings them to his mouth. He no longer exhibits the "tongue thrust" motion when a spoon or object is placed in his mouth.

Ms Roberts advises mixing a small amount of iron-fortified rice cereal with expressed breast milk and offering it to John on a spoon. She recommends that John's mother try feeding him the cereal when he is well rested and slightly hungry.

When John's mother first feeds him the rice cereal, he looks surprised but swallows it. He accepts a second spoonful, then turns his head away. The next day, John's mother offers him the cereal mixture again, and he eagerly eats 4 spoonfuls. She slowly increases the amount of cereal to several tablespoons.

Over the next few weeks, John's mother gradually begins to introduce pureed meats and then pureed or soft fruits and vegetables into John's diet. She is careful to offer new foods one at a time and to observe John for 3 to 5 days or more to make sure he does not have an adverse reaction. John continues to breastfeed on demand.



*John's mother is careful to offer new foods one at a time and to observe John for 3 to 5 days or more to make sure he does not have an adverse reaction.*



# Frequently Asked Questions About Nutrition in Infancy

## ***What should I feed my baby?***

- Breast milk is the ideal food for babies, and breastfeeding offers many benefits to both mothers and babies. Breastfeeding helps mothers and babies form special bonds and also helps babies resist colds, ear infections, allergies, and other illnesses.
- Exclusive breastfeeding is recommended for 4 to 6 months, but breastfeeding even for just a few months or weeks is beneficial.
- If you think you may not be able to breastfeed (eg, you have conflicts with school or work, or you have a medical condition) or if you are worried about not producing enough breast milk, talk to a health professional, breastfeeding specialist, or breastfeeding support group. They can answer your questions and help you come up with solutions. Your family and friends are also sources of support.
- If you decide to feed your baby infant formula, a health professional can help you choose the right kind of formula and answer your questions about feeding and the preparation of infant formula.
- Breast milk or iron-fortified infant formula is recommended until your baby is 12 months old. Low-iron milk (eg, cow's, goat's, soy) should not be used, even in infant cereal.
- Cow's milk, goat's milk, and soy milk are not recommended until after your baby's first birthday. Indications for use of soy-based formula instead of cow's milk formula include a preference for a vegetarian diet or an infant with galactosemia or hereditary lactase deficiency (rare).

## ***How do I know if I am feeding my baby enough breast milk?***

- Your baby may show she is hungry by sucking, putting her hands in her mouth, opening and closing her mouth, or looking for the nipple. She may show she is full by falling asleep.
- Your baby will usually have 5 to 8 wet diapers and 3 or 4 stools per day by the time she is 5 to 7 days old.
- Your baby will be gaining weight. She should gain 4 to 7 oz per week and should double her birth weight by age 4 to 6 months.

## ***What is colic? How can I prevent or manage it?***

- When your baby cries without apparent reason for several hours on a regular basis, he may have colic. Colic occurs in almost 10% of babies. No one knows what causes colic, but poor parenting does not cause it. Colic usually develops between ages 2 and 6 weeks and disappears by age 3 or 4 months.
- There is no cure for colic. Here are some tips to help manage colic as you wait for your baby to outgrow it.
  - If you are breastfeeding, continue to breastfeed through the first year of life. Breastfeeding does not cause your baby to have colic.
  - Cuddle and rock your baby during crying bouts.
  - Swaddle your baby, or apply firm but gentle pressure to the stomach.
  - Darken the room or play soft music.
  - Get help so you can take time off from caring for your baby.

### **When and how should I introduce solid foods?**

- Introduce solids foods between ages 4 and 6 months and when the tongue thrust reflex (pushing food out of the mouth) is fading, the sucking reflex has changed to allow more coordinated swallowing, your baby can sit with support, and she has good head and neck control. Offer a small amount (eg, 1 or 2 teaspoons) of one new food at a time. Wait 3 to 5 days to see how your baby tolerates the new food before introducing the next new food.
- Iron-fortified, single-grain infant cereals (eg, rice cereal) and pureed meats are good choices for first foods, especially for the breast-fed infant, because they provide iron, zinc, protein, and other nutrients. These foods are least likely to cause an allergic reaction. Mixing cereal with breast milk or infant formula will make your baby more likely to accept the cereal.
- Repeated exposure to foods (10–15 tries) will make your baby more likely to accept the foods.
- Give your baby foods of varying textures (eg, pureed, blended, mashed, finely chopped, and soft lumps) as your baby developmentally progresses in eating skills from gumming to chewing foods. A gradual exposure to solid textures during the sensitive period for learning to chew (from the time solids are introduced through age 10 months) may decrease the rejection of certain textures and refusal to chew later.
- Do not add cereal to bottles or “baby food nurser kits.”

### **When should I introduce juice, and how much?**

- At age 6 months or later, introduce juice in a cup.
- Offer 100% juice in small amounts (eg, 4–6 oz per day). Too much juice (>6 oz per day) may decrease your baby’s appetite for other foods and increase the risk for loose stools and diarrhea.

### **How can I tell if my baby is ready to feed herself?**

- If your baby can pick up food and chew or mash it, she is ready to feed herself soft pieces of table food.

### **How can I protect my baby’s teeth from tooth decay?**

- Minimize exposure to natural or refined sugars in your baby’s mouth by
  - Holding your baby while feeding and never propping a bottle (eg, do not use pillows or any other object to hold a bottle in your baby’s mouth).
  - Breastfeeding or feeding your baby infant formula in a bottle. Give your baby juice in a cup, not in a bottle, because juice in a bottle can bathe her teeth in sugar for long periods.
  - Not allowing your baby to fall asleep with a bottle that contains milk, formula, juice, or other sweetened liquid.
  - Avoiding dipping pacifiers in any sweetened liquid, sugars, or syrups.
- Clean your baby’s gums with a clean damp cloth or toothbrush and plain water after each feeding. Use a soft-bristled toothbrush with a small head designed for babies.
- Brush your baby’s teeth as soon as the first tooth erupts, usually around age 6 to 10 months, twice a day.
- Serve your baby 100% fruit juice in a cup in small amounts, no more than about 4 to 6 oz per day.

### **When should I wean my baby from the bottle?**

- As your baby begins to eat more solid foods and drink from a cup (at about age 9–10 months), you can begin to wean him gradually from a bottle.
- By age 12 to 14 months, most babies can drink from a cup.

### **When should I give my baby cow’s milk?**

- Continue to feed your baby breast milk or iron-fortified infant formula for the first year of life.
- After your baby’s first birthday, you can feed her cow’s milk, goat’s milk, or soy milk.

### Should I give my baby sweets?

- Do not give your baby sweets, such as sweetened drinks, candy, cake, or cookies, during the first year of life. Your baby needs to eat healthy (nutrient-rich) foods for growth and development.

### How do I avoid feeding my baby too much?

- Breastfeed, if possible, because breastfed babies have more control over how much they eat at each feeding.
- Learn how your baby shows he is hungry, and feed him only when he is hungry. Feed your baby slowly. Do not enlarge the hole in the bottle nipple to make expressed breast milk or infant formula come out faster.
- Do not add cereal to the bottle; this may cause your baby to eat more than he needs.
- Comfort your baby by talking to him and by cuddling, rocking, and walking him—not by feeding him. Using food to comfort your baby may teach him to use food as a source of comfort as he gets older.
- Feed your baby until he is full. It takes about 20 minutes for your baby to feel full. Don't force her to finish a bottle or other foods. Stop feeding her at the earliest sign of unwillingness to eat.
- When your baby is eating solid foods, feed him nutritious foods (eg, fruits, vegetables, lean meats, whole grains with breast milk or iron-fortified infant formula), and avoid feeding him foods that provide calories without nutrients (eg, sweetened drinks, french fries, chips, candy, cake).
- Serve meals and snacks at regular times, and avoid continuous feeding or “grazing.”

### What can I expect my baby to do as she grows?

From birth to about age 1 month, your baby will

- Begin to develop the ability to start and stop sucking.
- Wake up and fall asleep easily.

At about age 3 to 4 months, your baby will

- Drool more.
- Put his hand in his mouth a lot.

At about age 4 to 6 months, your baby will

- Bring objects to her mouth.
- Begin to eat solid foods, such as pureed or soft meats, fruits, and vegetables, and iron-fortified infant cereals.
- Explore foods with her mouth.

At about age 7 to 9 months, your baby will

- Try to grasp foods, such as toast, crackers, and teething biscuits, with all fingers and pull them toward his palm.
- Move food from one hand to the other.

At about age 9 to 11 months, your baby will

- Reach for pieces of food and pick them up between her thumb and forefinger.
- Try to hold a cup.
- Pick up and chew soft pieces of food.

### RESOURCES FOR FAMILIES

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# Early Childhood







# Early Childhood

## CONTEXT

During early childhood, a child's world expands to include friends, schoolmates, and others in the community. The child's physical, cognitive, social, and emotional development are tightly linked. For example, nutrition affects not only children's physical health but also their emotional health. When offered developmentally appropriate food in a supportive environment, children can thrive.

Early childhood is divided into 2 stages: the toddler stage (ages 1 and 2) and the young child stage (ages 3 and 4). The toddler stage can be stressful for parents as toddlers develop a sense of independence. Toddlers may struggle with their parents over food, refusing to eat certain foods. In addition, toddlers are still developing fine motor skills, so eating is often messy. By age 3, young children usually are more competent at feeding themselves than they were as toddlers; however, they still prefer eating with their hands rather than using utensils. Both toddlers and young children can recognize internal cues of hunger and fullness and serve themselves accordingly.<sup>1</sup> As they get older, many young children become more interested in trying new foods, and they enjoy participating in family meals.

Practicing healthy eating behaviors during early childhood is essential for

- Promoting optimal growth, development, and health
- Preventing immediate health problems (eg, iron-deficiency anemia, undernutrition, vitamin D deficiency, overweight or obesity, dental caries [tooth decay])
- Laying the foundation for lifelong health and reducing the risk for chronic diseases (eg, cardiovascular disease, type 2 diabetes mellitus, obesity, hypertension, some forms of cancer, osteoporosis)

## GROWTH AND PHYSICAL DEVELOPMENT

A child's birth weight quadruples by age 2. Between ages 2 and 5, children gain an average of 4.5 to 6.5 lb per year and grow 2.5 to 3.5 inches per year. As the growth rate declines during early childhood, a child's appetite decreases, and the amount of food consumed may become unpredictable.<sup>2</sup> To promote optimal growth and development, children should be offered foods at scheduled mealtimes (3 daily) and snack times (2–3 daily).

During early childhood, children predominantly use their cheeks rather than their tongues to swallow. As toddlers' eating skills develop, they progress from eating soft pieces of food to foods with more texture. By age 3 or 4, children are able to use their fingers to push food onto a spoon, pick up food with a fork, and drink from a cup. Young children do not yet have the muscle control to cut their food or eat all foods neatly. However, if they can shovel sand or pour water from a pail, they can be taught to serve themselves food from bowls and plates—an important self-help skill that allows them to self-regulate their food intake. When children are allowed to serve themselves, they tend to take less and eat what they take.<sup>1</sup>



Children who are bottle-fed should be weaned from the bottle and encouraged to use a cup at about age 12 to 14 months. The risk for tooth decay increases if children are allowed to suck on a bottle or sipper-type (“sippy”) cup containing beverages high in sugar (eg, fruit drinks, fruit juice), milk, or formula during the day or night for prolonged periods, because these beverages can pool around their teeth.

## DEVELOPMENT ISSUES

### THE TODDLER: AGES 1 TO 2

Toddlers tend to be leery of new foods and may refuse to eat them. They need to look at the new foods and touch, smell, feel, and taste them many times before they accept them.<sup>3,4</sup> Toddlers are unpredictable. They may like certain foods one day and dislike them the next. They may eat a lot one day and very little the next. Unlike adults, they usually eat only 1 or 2 foods at a meal. Parents often become alarmed when toddlers’ eating behaviors change radically or abruptly. Toddlers’ growth rates decrease during early childhood; therefore, their energy needs decrease. Despite these changes, toddlers usually consume a variety of foods if parents continue to serve developmentally appropriate healthy meals and snacks.

To encourage toddlers to establish healthy eating behaviors, parents need to provide a structured but pleasant mealtime environment and serve as role models by eating a variety of foods. Parents should include their toddler in family meals by providing a high chair or booster seat at table height and using appropriate-sized utensils and cups.

### THE YOUNG CHILD: AGES 3 TO 4

Around age 3 or 4, most young children become more curious about food, although they still may be reluctant to try new foods. This reluctance can be overcome if parents talk about new foods and allow their child to prepare and perhaps grow them.

As young children grow, they become less impulsive and can follow instructions. They can stay calm when they are hungry, join in conversation during mealtimes, serve themselves from bowls and plates, and pass food to others. Young children are more comfortable eating in unfamiliar places than they were as toddlers.

Young children should be encouraged to try new foods. The goal is for children to accept a variety of healthy foods—not simply to eat what is on their plates.

## HEALTHY LIFESTYLES

The most important nutrition message to impart to parents is that they need to offer their child a variety of healthy foods throughout the day, given in 3 small meals and 2 to 3 snacks. After age 2, children should gradually reduce the number of calories they consume from high-fat foods, so that by age 5 they are eating between 25% and 35% of their total daily calories as fat.<sup>5</sup> As children begin to consume fewer calories from fat, they need to eat more whole-grain products; fruits; vegetables; low-fat milk products and other calcium-rich foods; and beans, lean meat, poultry, fish (especially those that contain special fats such as salmon, trout, and albacore tuna),<sup>6</sup> and other protein-rich foods.

Early childhood is a key time for promoting the development of motor skills and good habits for physical activity that will last a lifetime. Most children are active but, because of space or safety concerns, they may not have the opportunity to master large motor skills, learn how their body moves in space, or play and explore. Parents need to plan activities so that children can master control of their large muscles but still have time to just play.

Physical activities (eg, running, jumping, climbing, throwing, catching) should be encouraged. Simple games such as Simon Says, chase, and tag are appropriate during early childhood. Dancing can help children learn to move in space (eg, sideways, backwards). Because most children need to develop their large and small motor skills, they are not ready for organized, competitive sports, which require visual acuity, control, cooperation, and balance. Being physically active helps ensure that children maintain a healthy weight.

## BUILDING PARTNERSHIPS

Early childhood provides an opportunity for health professionals, families, and communities to teach children about healthy eating behaviors, encourage positive attitudes toward food and eating, and promote regular physical activity.

Health professionals can give parents the opportunity to discuss nutrition issues and concerns about their children and can identify and contact community resources to help parents feed their children.

Many children spend time with child care providers or participate in Head Start or other preschool programs, which provide opportunities for promoting healthy eating behaviors. Children in community programs can be introduced to new foods and may try them more readily if their peers seem to be enjoying them.

Children need a variety of healthy foods served in a pleasant environment. Nutrition education should be part of the education curriculum, and child care facilities should serve a variety of healthy foods that children learn about in the program. Federally funded food assistance programs help provide children with a substantial part of their daily nutrient requirements. (See Tool K: Federal Nutrition Assistance Programs.) Food shelves and pantries, community groups, and faith-based organizations can also provide food.

Communities need to provide physical activity programs (eg, at child care facilities, recreation centers) and safe places for children to play.

## COMMON NUTRITION CONCERNS

Based on data from the National Health and Nutrition Examination Survey (1976–1980 and 2003–2006), obesity prevalence has risen from 5% to 12.4% among children ages 2 to 5.<sup>7</sup> The consequences of this epidemic are not simply cosmetic. Children who are obese often remain obese into adulthood, and higher degrees of excess weight are associated with increasing risk of persistent obesity.<sup>8</sup> Obesity is associated with many chronic health conditions, including diabetes mellitus, hypertension, dyslipidemia, and cardiovascular disease.<sup>9</sup> (See the Obesity chapter.)

Iron deficiency and iron-deficiency anemia are common in children, especially children from families with low incomes. (See the Iron-Deficiency Anemia chapter.) Iron-deficiency anemia may have adverse effects on growth and development. The prevalence of iron-deficiency anemia can be reduced by doing the following<sup>10,11</sup>:

- Waiting until children are 12 months old before feeding them cow's milk
- Offering children no more than 16 oz of cow's milk daily
- Encouraging consumption of iron-rich foods (eg, meat, fish, poultry) and foods that contain vitamin C (eg, fruits, vegetables), which enhances iron absorption

Children with special health care needs may have nutrition concerns, including poor growth, poor eating skills, inadequate or excessive food intake, developmental delays, elimination problems, and metabolic disorders. These children may need specialized care from a dietitian; they may also need referral to early intervention programs in their communities. (See the Children and Adolescents With Special Health Care Needs chapter.)

# Nutrition Supervision

A child's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. (For more information on health supervision, see *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, 3rd Edition, listed under Suggested Reading in this chapter.) It is important to remember that nutrition supervision, which includes asking interview questions, conducting screening and assessment, and providing anticipatory guidance, should be used as appropriate and will vary from visit to visit and from child to child.

Health professionals begin nutrition supervision by selectively asking interview questions about the child's nutrition status to invite discussion and build partnerships. Use of the questions may vary from visit to visit and from family to family. Questions can be modified to match the health professional's communication style. Gathering information can also be accomplished by reviewing a questionnaire filled out by parents before the visit. (See Tool B: Nutrition Questionnaire for Children Ages 1 to 10) Additionally, to meet the challenge of providing nutrition supervision to diverse populations, health professionals need to appreciate the variety of cultural traditions related to food and the wide variation in food practices within and among cultural groups. (See the Cultural Awareness in Nutrition Services chapter.) Asking interview questions provides a useful starting point for identifying a child's nutrition concerns.

These methods provide a useful starting point, followed by screening and assessment to identify a child's nutrition concerns. The accompanying anticipatory guidance should be geared to address the family's questions and nutrition concerns for that particular child and family. Health professionals provide anticipatory guidance to parents to offer information on the child's nutrition status, to make parents aware of what to expect as the child enters the next developmental period, and to foster the promotion of healthy eating behaviors. (See Tool G: Strategies for Health Professionals to Promote Healthy Eating Behaviors.)

Nutrition supervision information that pertains to the entire early childhood developmental period (Nutrition Supervision Throughout Early Childhood) is provided first, followed by information for age-specific visits. Interview questions, screening and assessment, and anticipatory guidance should be used as appropriate and will vary from visit to visit and from child to child.

## NUTRITION SUPERVISION THROUGHOUT EARLY CHILDHOOD

### Interview Questions

- What concerns do you have about your child's eating behaviors or growth?
- How does your child let you know when she is hungry and when she is full?
- What concerns do you have about your child's weight?
- Describe what your child does during mealtimes. What do you do?
- What do you do if your child doesn't like a particular food?
- Do you enjoy sharing meals and snacks with her?
- Do you have appropriate equipment for feeding your child (for example, cups, eating utensils, a highchair, a booster seat)?
- Do you have any concerns about the food served to her when she is away from home?
- What is the source of your drinking and cooking water? Do you use bottled or processed water?
- Are you concerned about having enough money to buy food?

### Screening and Assessment

#### Growth and Development

- Measure the child's length or height and weight, and plot these on a standard growth chart. Deviation from the expected growth pattern (eg, a major change in growth percentiles on the chart) should be evaluated. This may be normal or may indicate a nutrition problem (eg, difficulties with eating).

- Length or height and weight measurements can be used to indicate nutrition and growth status. Changes in weight reflect a child's short-term nutrient intake and serve as general indicators of nutrition status and overall health. Low height-for-age reflects long-term, cumulative nutrition or health problems.
- Body mass index (BMI) is used as a screening tool to determine nutrition status and overall health. Calculate the child's BMI by dividing weight by the square of height (kg/m<sup>2</sup>) or by referring to a BMI chart. Plot the child's BMI on a BMI-for-age and sex growth chart to determine the child's BMI-for-age percentile.
- Evaluate the appearance of the child's skin, hair, teeth, gums, tongue, and eyes.

### ***Iron-Deficiency Anemia***

- Recommendations for iron-deficiency anemia screening have been put forth by the American Academy of Pediatrics (AAP) and the Centers for Disease Control and Prevention (CDC). (See the Iron-Deficiency Anemia chapter.)

### **Children 12 to 18 Months**

- The AAP recommends universal screening for all children for iron deficiency and iron-deficiency anemia at about age 12 months and about age 18 months.<sup>10</sup>
- The CDC recommends screening children at high risk for iron-deficiency anemia or those with known risk factors for iron-deficiency anemia at ages 9 to 12 months and again 6 months later (ages 15–18 months).<sup>11</sup>
  - Children considered at high risk for iron-deficiency anemia include<sup>11</sup>
    - Children from families with low incomes
    - Children who are eligible for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC)
    - Children who are migrants or recently arrived refugees
    - Children who are Mexican American<sup>10</sup>
  - Children who have known risk factors for iron-deficiency anemia include<sup>11</sup>
    - Children born preterm or with low birth weight
    - Children fed non-iron-fortified infant formula for more than 2 months
    - Children fed cow's milk before age 12 months

- Children who are breastfed and do not receive adequate iron from supplemental foods after age 4 months
- Children who consume more than 24 oz of cow's milk per day
- Children with special health care needs who use medications that interfere with iron absorption (eg, antacids, calcium, phosphorus, magnesium), or those with chronic infection, inflammatory disorders, restricted diets, or extensive blood loss from a wound, an accident, or surgery

### **Children Ages 2 to 5**

- The AAP recommends screening children for iron-deficiency anemia annually, if any of the following risk factors are present<sup>3</sup>:
  - Children with special health care needs
  - Children who consume a diet low in iron
  - Children who consume a vegetarian diet
  - Children from low socioeconomic status
  - Children in families with limited access to food
- The CDC recommends screening of children annually, if any of the following risk factors are present<sup>11</sup>:
  - Children who consume a diet low in iron
  - Children with limited access to food because of poverty or neglect
  - Children with special health care needs
  - Children from families with low incomes
  - Children who are eligible for WIC
  - Children who are migrants or recently arrived refugees

### ***Oral Health***

- Ask whether the child has regular dental visits.
- Assess eating behaviors (eg, frequency of eating foods and beverages high in sugar) to determine the child's risk for dental caries (tooth decay). (See the Oral Health chapter.)

### ***Physical Activity***

- Ask how much physical activity the child is doing on a weekly basis.
- Screen for the amount of time the child spends watching television and on other media activities, such as computer or video games. Ask whether the child watches television during mealtimes.

### Anticipatory Guidance

Anticipatory guidance should address the child's and parents' nutrition concerns. In addition, health professionals should offer information on the child's nutrition status; make the child and parents aware of what to expect as the child enters the next developmental period; and promote a positive attitude toward eating behaviors, food choices, and physical activity. (For additional information, see Tool F: Stages of Change—A Model for Nutrition Counseling and Tool G: Strategies for Health Professionals to Promote Healthy Eating Behaviors.)

#### Parent-Child Feeding Relationship

- Inform parents that they are responsible for what, when, and where their child eats. To ensure that their child's nutrition needs are met, parents need to
  - Purchase and prepare nutritious food.
  - Schedule mealtimes and snack times, offering developmentally appropriate and healthy foods.
  - Make mealtimes and snack times pleasant.
  - Make sure their child develops eating and self-serving skills (eg, progresses from using his hands for eating to using utensils).<sup>12</sup>
  - Help their child learn to self-regulate food intake by responding to internal cues of hunger and fullness.
- Tell parents that children are responsible for deciding whether to eat and how much.<sup>12</sup>

#### Eating Behaviors

- Emphasize to parents that children need healthy meals and snacks at scheduled times throughout the day to help them achieve nutritional balance.<sup>13</sup>
- Tell parents that children are unpredictable in the amounts and types of foods they eat, from meal to meal and from day to day. Reassure parents that children usually eat enough food to meet their nutrition needs.
- Instruct parents to modify foods to make them easier for their child to eat.
- Tell parents to provide healthy snacks rich in complex carbohydrates and only moderate amounts of sweets and high-calorie, low-nutrient snacks. Some examples include whole-wheat crackers with string cheese, plain yogurt with sliced peaches, or milk and an oatmeal cookie.

- Encourage parents to offer their child whole-grain breads and cereals.
- Explain to parents that from ages 2 to 5, children make the transition from the higher fat intake infants need to the lower fat intake recommended for the rest of the population. Inform parents that children's fat intake should gradually be reduced to no more than 25% to 35% of their daily calories by age 5. Tell parents that children ages 2 to 3 need the same number of servings as children ages 4 to 6, but younger children may need smaller portions—about two-thirds of a serving for each serving an older child would eat.<sup>14</sup>
- Instruct parents to serve children ages 1 to 2 whole milk. After age 2, children should gradually increase the proportion of low-fat foods in their diets. For children older than age 2, low-fat (1%) or fat-free (skim) milk is recommended.<sup>14</sup> Reduced-fat milk (2%) is recommended for children ages 1 to 2 for whom obesity is a concern or who have a family history of obesity, dyslipidemia, or cardiovascular disease.<sup>15</sup>
- Explain to parents that as children begin to consume fewer calories from fat, they need to eat more grain products, especially whole grains; fruits; vegetables; low-fat milk and milk products; and beans, lean meat, poultry, fish, and other protein-rich foods.
- Tell parents to offer 2 servings of milk (two 8-oz cups) per day to children ages 2 to 6.<sup>14</sup> Excessive milk intake can reduce the child's appetite for other foods.
- Tell parents that to prevent rickets and vitamin D deficiency, children who do not obtain 400 IU/day of vitamin D through vitamin D-fortified milk (100 IU per 8-oz serving) and vitamin D-fortified foods (eg, fortified cereals, eggs [yolk]) should receive a vitamin D supplement of 400 IU/day.<sup>16</sup>
- Explain to parents that by the time children are 4 years old, they can eat serving sizes similar to those eaten by older family members (eg, ½ cup of fruits or vegetables; ¾ cup of 100% fruit juice; 1 slice of whole-grain bread; 2 to 3 oz of cooked lean meat, poultry, or fish).
- Encourage parents to wean their child from the bottle by age 12 to 14 months.
- Instruct parents to serve 100% fruit juice in a cup instead of a bottle and to limit the child's consumption of juice to 4 to 6 oz per day.

- Explain to parents that children who drink unlimited amounts of 100% fruit juices or sweetened beverages (eg, fruit drinks, soft drinks) are at increased risk for dental caries (tooth decay) and minor infections and may experience loose stools and diarrhea.
- Emphasize to parents that children who consume unlimited amounts of foods (eg, candy, cookies) and beverages (eg, fruit drinks, soft drinks) high in sugar are likely to fill up on these foods rather than eat healthy foods.
- Encourage parents to make sure their child drinks plenty of water throughout the day.

### **Mealtimes**

- Encourage parents to offer children healthy food choices at meals served at approximately the same time each day. Mealtimes at home, preschool, child care, and other places can be used to teach children to make healthy food choices.
- Explain to parents that meals and snacks are important social times for children. Parents should turn off the television and make mealtimes and snack times pleasant.
- Emphasize to parents that children eat better when an adult is nearby, particularly when the adult shares the meal or snack with them.
- Tell parents that once a child can shovel sand or pour water from a pail, parents can teach the child to serve herself at the table.
- Encourage parents to be patient and understanding if their child makes a mess while she learns to feed or serve herself.
- Tell parents that they can encourage their child to eat new foods by offering small portions—perhaps 1 or 2 tablespoons—and allowing the child to serve herself the food.
- Encourage parents to be positive role models when they offer new foods to their child by eating these foods themselves.
- Instruct parents to offer their child a variety of healthy foods, and allow the child to choose which ones to eat.
- Instruct parents to modify foods to make them easier and safer for their child to eat.
- Caution parents not to pressure their child to eat certain foods or to eat more than she wants. Parents can help their child respond to internal hunger and fullness cues.

- Tell parents not to use foods to reward, bribe, or punish their child or to calm, comfort, or entertain her.
- Emphasize to parents that children benefit when parents praise them for their accomplishments and are patient and understanding.
- Encourage parents to offer dessert as part of the meal. A small serving of certain desserts (eg, custard, pudding, fruit, yogurt) makes a healthy contribution to the meal.
- Explain to parents that because young children often eat small amounts of food at one time, they should be offered nutritious foods (eg, whole-grain crackers, milk and milk products, fruits, vegetables, meat or poultry) as snacks.

### **Food Safety**

- Inform parents that children are at high risk for many foodborne illnesses because their immune and gastrointestinal systems are not fully developed. To reduce the risk for foodborne illnesses, parents need to follow food safety practices. (See Tool H: Basics for Handling Food Safely.)
- Tell parents to use a high chair or booster seat when feeding their child.
- Provide parents with instructions, as needed, about special techniques for positioning, special equipment, or modified utensils for feeding their child with special health care needs.
- Instruct parents to take the following precautions to prevent their child from choking<sup>17</sup>:
  - Stay with children while they are eating.
  - Have children sit while eating. Eating while walking or running may cause choking.
  - Do not allow children to eat in the car. If the parent is driving, he or she will not be able to help if choking occurs.
  - Keep mealtimes and snack times calm. Overexcitement while eating may cause children to choke.
  - For toddlers, foods that may cause choking should be avoided (eg, hard candy, mini-marshmallows, popcorn, pretzels, chips, spoonfuls of peanut butter, nuts, seeds, large chunks of meat, hot dogs, raw carrots, raisins and other dried fruits, whole grapes).<sup>13</sup>

- Explain to parents that children ages 3 to 5 may eat these foods if they are modified to make them safer (eg, cutting hot dogs in quarters lengthwise and then into small pieces, cutting whole grapes in half lengthwise, chopping nuts finely, chopping raw carrots finely or into thin strips, spreading peanut butter thinly on crackers or bread).<sup>17</sup>
- Caution parents not to let their child eat in the car. If the parent is driving, he or she will not be able to help the child.

### ***Teaching Children About Food***

- Encourage parents to offer their child a wide variety of healthy foods.
- Tell parents that they can help their child learn about foods from other cultures by offering foods from other cultures.
- Encourage parents to teach their child how foods are grown (eg, by planting a vegetable garden) and where foods come from (eg, by visiting a dairy farm).
- Suggest that parents read books about foods to their child and talk about what they ate when they were children.
- Encourage parents to involve the child in food shopping and preparation.

### ***Oral Health***

- Instruct parents with children ages 1 to 2 to brush their child's teeth with a small, soft toothbrush and a smear of fluoridated toothpaste twice a day (after breakfast and before bed).
- Instruct parents with children ages 2 and older to brush their child's teeth using a small, soft toothbrush and a pea-sized amount of toothpaste twice a day (after breakfast and before bed).
- Explain to parents that toothbrushing requires good fine motor control and that young children cannot clean their teeth without parental help. After children acquire fine motor skills (eg, the ability to tie their shoelaces), typically by age 7 or 8, they can clean their teeth effectively but should be supervised by a parent.
- Tell parents that limiting their child's consumption of foods (eg, candy, cookies) and beverages (eg, fruit drinks, soft drinks) high in sugar can help prevent dental caries (tooth decay).

- Explain to parents that drinking fluoridated water is a safe and effective way to significantly reduce the risk for tooth decay in children. (See the Oral Health chapter.) For families that prefer bottled water, a brand in which fluoride is added at a concentration of approximately 0.8 to 1.0 mg/L (ppm) is recommended.<sup>18</sup>

### ***Physical Activity***

- Tell parents that children's bodies need bursts of activity followed by short periods of rest.
- Explain to parents that children need to engage in both structured and free play so that their large motor skills and spatial awareness develop in a progressive, sequential way.<sup>19</sup> Structured play occurs when the child is involved in an activity that serves a developmental physical purpose (eg, following the leader to master hopping), whereas in free play, the child can move in any way he likes.
- Encourage parents to be good role models by playing with their child and being physically active themselves. Parents' involvement and enthusiasm have a positive impact on their child's play experiences.
- Suggest that parents plan activities each week to encourage all family members to be physically active.
- Encourage parents to let their child decide which physical activities the family will do together but to match the child's abilities to the activity (eg, walking, hiking, skating, swimming, playing tag).
- Point out to parents that community projects (eg, neighborhood cleanup days, community gardens, food drives) provide opportunities for the entire family to be physically active together.
- Discourage television viewing for children younger than age 2, and encourage more interactive activities that promote proper brain development, such as talking, playing, singing, and reading together.
- For children ages 2 and older, long periods of sedentary activity, such as watching television or playing computer or video games, should be discouraged. Limit the child's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day.<sup>20</sup>

## NUTRITION SUPERVISION BY VISIT

### 1 YEAR

Health professionals should use the general information in the section Nutrition Supervision Throughout Early Childhood (pages 56–60) as well as the age-specific information that follows.

#### Interview Questions

- What is your child's feeding routine?
- Are you breastfeeding your child? Are you giving him infant formula or milk in a bottle or cup?
- What type of infant formula or milk do you feed him?
- How much fruit juice or how many sweetened drinks (for example, fruit drinks, soft drinks) does your child drink? Is the juice 100% fruit juice? When does he drink them?
- Does your child drink from a cup? Does he drink from a bottle now and then? If so, what are your plans for weaning him from the bottle?
- What textures of food does your child eat? Does he eat pieces of soft food?
- Describe what your child does during mealtimes. Does he eat with the family?
- What concerns do you have about your child's weight?

#### Screening and Assessment

- Screen the child for lead exposure. (See Tool E: Screening for Elevated Blood Lead Levels.)
- Evaluate the child's progress in developing eating skills. Make sure the child
  - Can bite off small pieces of food.
  - Can put food in the mouth.
  - Has an adequate gag reflex.
  - Can retain food in the mouth (ie, doesn't immediately swallow).
  - Can chew food in an up-and-down or rotary motion.
  - Can use a "pincer grasp" to pick up small pieces of food.
  - Can drink from a cup.
- Evaluate the child's interest in active play. Children should be actively playing with a parent daily. Bouncing, crawling, and climbing are age-appropriate activities.

#### Anticipatory Guidance

- Encourage parents to give their child opportunities to develop her eating skills (including chewing and swallowing) by offering a variety of foods and to feed herself at the family table.
- Instruct parents to serve their child beverages in a cup. Children may need help drinking from a cup; however, they may be able to use a sipper-type ("sippy") cup by themselves.
- Encourage parents to serve their child a variety of soft foods.
- Explain to parents that children are unpredictable in the amount and types of foods they eat from meal to meal and from day to day. Reassure parents that children usually eat enough food to meet their nutrition needs.
- Instruct parents to offer their child food every 2 to 3 hours, because children's capacity to eat at any one time is limited. Begin to schedule meals and snacks.
- Explain to parents that children will test limits by asking for certain foods and perhaps by throwing tantrums when refused.
- Reassure parents that they can impose limits on their child's unacceptable mealtime behaviors without controlling the amount or types of foods she eats.
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes. Discourage television viewing for children younger than age 2, and encourage more interactive activities that will promote proper brain development, such as talking, playing, singing, and reading together.<sup>20</sup>

### 15 MONTHS

Health professionals should use the general information in the section Nutrition Supervision Throughout Early Childhood (pages 56–60), as well as the age-specific information that follows.

#### Interview Questions

- Are you breastfeeding your child? Are you giving him bottles? Milk in a cup? What kind of milk does he drink? How much?
- How much fruit juice or how many sweetened drinks (for example, fruit drinks, soft drinks) does your child drink? Is the juice 100% fruit juice? When does he drink them?

- Which foods does your child like to eat? Are there any foods he doesn't like?
- Describe your child's mealtimes. Does he eat with the family?
- Does he ask for food between meals and snacks? If so, how do you handle this?
- Does your child throw tantrums over food? If so, how do you handle them?
- What kinds of physical activities does your child enjoy?
- What concerns do you have about your child's weight?

### Screening and Assessment

- Evaluate the child's progress in developing large motor skills. Children should be actively playing with a parent daily.

### Anticipatory Guidance

- Instruct parents to offer their child food every 2 to 3 hours, because children's capacity to eat at any one time is limited.
- Explain to parents that by age 15 to 18 months, the child should be able to eat healthy foods that the family is eating at mealtimes, as long as parents are offering age-appropriate foods (eg, foods cut into small pieces). Continue to monitor the size of foods offered. Chewing and swallowing functions are not completely developed until about age 8.
- Instruct parents to use spoons, cups, and dishes with steep sides (eg, bowls) to make eating easier for the child.
- Reassure parents that children will become increasingly skilled at eating a variety of foods.
- Emphasize to parents that children benefit from a relaxed atmosphere during meals and snacks. Children should not be rushed, because trying new foods takes time.
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes. Discourage television viewing for children younger than age 2, and encourage more interactive activities that will promote proper brain development, such as talking, playing, singing, and reading together.<sup>20</sup>

## 18 MONTHS

Health professionals should use the general information in the section Nutrition Supervision Throughout Early Childhood (pages 56–60), as well as the age-specific information that follows.

### Interview Questions

- Are you breastfeeding your child? Are you giving him bottles? Milk in a cup? What kind of milk does he drink? How much?
- How much fruit juice or how many sweetened drinks (for example, fruit drinks, soft drinks) does your child drink? Is the juice 100% fruit juice? When does he drink them?
- Which foods does your child like to eat? Are there any foods he doesn't like?
- Describe your child's mealtimes. Does he eat meals with the family?
- Does he ask for food between meals and snacks? If so, how do you handle this?
- Does your child throw tantrums over food? If so, how do you handle them?
- What concerns do you have about your child's weight?

### Screening and Assessment

- Screen the child for lead exposure. (See Tool E: Screening for Elevated Blood Lead Levels.)
- Evaluate the child's progress in developing large motor skills. Children should be actively playing with a parent daily.

### Anticipatory Guidance

- Instruct parents to offer their child food every 2 to 3 hours, because children's capacity to eat at any one time is limited.
- Encourage parents to give their child opportunities to develop her eating skills (including chewing and swallowing) by offering a variety of foods and to feed herself at the family table.
- Explain to parents that children need forks and spoons that are designed for them (ie, those that are smaller and easier to use).
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes. Discourage television viewing for children younger than age 2, and encourage more interactive activities that will promote proper brain development, such as talking, playing, singing, and reading together.<sup>20</sup>

## 2 YEARS

Health professionals should use the general information in the section Nutrition Supervision Throughout Early Childhood (pages 56–60), as well as the age-specific information that follows.

### Interview Questions

- Has your child been weaned from the bottle?
- What kind of milk does she drink? How much?
- How much fruit juice or how many sweetened drinks (for example, fruit drinks, soft drinks) does your child drink? Is the juice 100% fruit juice? When does she drink them?
- Which foods does your child like to eat? Are there any foods she doesn't like?
- Describe your child's mealtimes. How often does she eat with the family?
- Can your child shovel sand into a pail or pour water from a bucket? If she can, let her try to serve foods from a bowl or platter onto her plate.
- Does she eat the same foods as the rest of the family?
- What do you do when your child does not want to eat or only wants to eat a particular food?
- What concerns do you have about your child's weight?

### Screening and Assessment

- Screen the child for lead exposure. (See Tool E: Screening for Elevated Blood Lead Levels.)
- Assess the child's risk for familial hyperlipidemia. (See the Hyperlipidemia chapter.)
- Evaluate the child's progress in developing large motor skills. Children should be actively playing with a parent daily.

### Anticipatory Guidance

- Encourage parents to give their child opportunities to develop her eating skills (including chewing and swallowing) by offering a variety of foods.
- Encourage parents to allow their child to self-regulate food intake by serving himself from bowls and plates. This is messy at first, but with practice, this self-help skill can be mastered.

- Reassure parents that food jags in children (when children only want to eat a particular food) are common. Smaller servings of the favored food can be offered along with other foods to ensure that the child eats a variety of healthy foods.
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes. Limit the child's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day. Encourage more interactive activities that will promote proper brain development, such as talking, playing, singing, and reading together.<sup>20</sup>

## 3 TO 4 YEARS

Health professionals should use the general information in the section Nutrition Supervision Throughout Early Childhood (pages 58–62), as well as the age-specific information that follows.

### Interview Questions

- What kind of milk does your child drink? How much?
- How much fruit juice or how many sweetened drinks (for example, fruit drinks, soft drinks) does your child drink? Is the juice 100% fruit juice? When does he drink them?
- Which foods does your child like to eat? Are there any foods he doesn't like?
- What concerns do you have about your child's weight?
- Describe what your child does during mealtimes. Does he serve himself foods? Does he eat meals with the family?
- How often do you serve snacks? What types of foods do you serve?

### Screening and Assessment

- Screen the child for lead exposure. (See Tool E: Screening for Elevated Blood Lead Levels.)
- Obtain the child's blood pressure. (See the Hypertension chapter.)
- Assess the child's risk for familial hyperlipidemia. (See the Hyperlipidemia chapter.)

- Evaluate the child’s progress in developing large motor skills. Children should be actively playing with a parent daily. By this age, many children can master running, marching, and galloping. Adults can direct children in ways to move their bodies around and through objects and in how to improve large and small muscle movements.

**Anticipatory Guidance**

- Explain that children become aware of new foods by seeing family members and friends trying, eating, and enjoying them.
- Suggest to parents that sharing stories, drawing pictures, and singing songs related to foods help children become familiar with the foods.

Children enjoy learning about new foods by growing, preparing, and talking about them.

- Tell parents that they need to guide their child to improve her fitness levels (stability, agility, endurance, and coordination).
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes. Limit the child’s total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day. Encourage more interactive activities that will promote proper brain development, such as talking, playing, singing, and reading together.<sup>20</sup>

The desired outcomes for the child and the role of the family can assist health professionals in promoting optimal nutrition.

**TABLE 1. DESIRED OUTCOMES FOR THE CHILD, AND THE ROLE OF THE FAMILY**

	<b>Educational and Attitudinal</b>	<b>Behavioral</b>	<b>Health</b>
<b>Desired Outcomes for the Child</b>	Tries new foods Enjoys a variety of healthy foods Enjoys being active	Gradually increases variety of foods eaten Eats healthy foods Participates in active play Masters increasingly complex large and small motor skills	Improves motor skills, coordination, agility, stability, endurance, and muscle tone Grows and develops at an appropriate rate Maintains good health
	<b>Educational and Attitudinal</b>	<b>Behavioral</b>	<b>Health</b>
<b>Role of the Family</b>	Understands that each child’s growth and development are unique Has a positive attitude toward food Understands the nutrition needs of the growing child and the importance of scheduled healthy meals and snacks Encourages the child to try a variety of healthy foods Encourages the child to recognize and listen to internal cues of hunger and fullness Understands the importance of modifying foods for the child to make them easier and safer to eat Understands the importance of a healthy lifestyle, including eating healthy foods and being physically activity	Offers developmentally appropriate foods Schedules healthy meals and snacks Offers a variety of foods Encourages child to serve herself foods from common bowls and platters Eats meals together regularly to ensure optimal nutrition and to facilitate family communication Provides positive role models by eating healthy foods and being physically activity Uses nutrition programs and food resources if needed Provides safe opportunities for structured and active playtimes	Maintains good health

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# Reducing Distractions During Mealtime

**T** Tyler Mikkelsen, a 22-month-old, is in a home child care facility 5 days a week while his parents work. Like many other children his age, Tyler is apprehensive about trying new foods. However, he has a good appetite, and his parents have been successful in getting him to try 1 or 2 bites of a new food by modeling their own willingness to eat that food.

Tyler's parents are thus surprised when Tyler's child care provider, Fran Eisenberg, asks to speak with them about Tyler's eating. Ms Eisenberg says that Tyler will not sit down at the table long enough to eat his meal and that Tyler refuses to try new foods and sometimes refuses to eat anything at all. Tyler's parents have not noticed any changes in his eating behaviors at home. They call Sandy Hill, a dietitian, for guidance.

Ms Hill suggests that Tyler's parents visit Ms Eisenberg's home when she feeds the children. She says that the mealtime environment at child care may be very different from the environment at home, which may be affecting Tyler's appetite and interest in eating. During their visit,

Tyler's parents find that Ms Eisenberg does not sit down to eat meals with the children. Ms Eisenberg turns on the television in the kitchen so the children can watch cartoons while they eat. Tyler's parents notice that Tyler is too busy watching the cartoons to pay attention to his food.



*Ms Eisenberg tells Tyler's parents that as a result of the changes, Tyler and the other children in her care are eating better and enjoying mealtimes together.*



Tyler's parents meet with Ms Eisenberg to discuss the mealtime environment. They tell her that they always eat at the table with Tyler to help him eat and to encourage him to try each food on his plate. They do not turn on the television during mealtimes because it distracts Tyler. Tyler's parents suggest that Ms Eisenberg join the children at mealtime to provide a family-like atmosphere. They also suggest that the television be turned off.

Ms Eisenberg agrees to try the changes to see whether Tyler's eating behaviors improve. Two weeks later, she tells Tyler's parents that as a result of the changes, Tyler and the other children in her care are eating better and enjoying mealtimes together.

# Frequently Asked Questions About Nutrition in Early Childhood

## ***How can I teach my child healthy eating behaviors?***

- Eat meals together as a family.
- Help your child learn to recognize internal hunger and fullness cues. When children are hungry, they may be irritable or tired or have difficulty focusing on a task. When they are full, they will begin eating more slowly or stop eating. Less subtle but equally important cues are ones that demand your attention, such as throwing food or utensils and playing with food.
- Allow your child to serve herself from bowls and platters, once she is able to (if children can shovel sand or pour water from a pail, they can be taught to serve themselves food from bowls and plates). This is an important self-help skill that also helps to regulate food intake.
- Offer a variety of healthy foods, and encourage your child to try different ones.
- Let your child help with food shopping and preparation.
- Do not use food to reward, bribe, or punish your child.
- Be a positive role model—practice healthy eating behaviors, and engage in regular physical activity.

## ***How can I make mealtimes enjoyable?***

- Be patient and understanding when your child makes a mess while she learns to feed herself—this is normal.
- Offer healthy foods for meals and snacks at scheduled times, but allow for flexibility.
- Use your child's favorite plate, bowl, cup, and eating utensils.
- Create a relaxed setting for meals (eg, turn off the television).
- Talk with your child at mealtimes.

## ***My 2-year-old's appetite has changed. Should I be worried?***

- Children grow more slowly from ages 1 to 5 than during the first 12 months of life. Infants usually have bigger appetites than young children do.
- Children's appetites change a lot from day to day and even from meal to meal. If your child is energetic and growing, he is probably eating enough.

## ***What should my child eat?***

- At mealtimes, offer what the rest of your family is eating (eg, whole-grain breads and cereals, pasta, or rice; fruits and vegetables; cheese or yogurt; and cooked lean meat, poultry, fish, or eggs).
- Children younger than age 2 usually eat small portions. Offer small portions (eg, 1 or 2 table-spoons), and let your child ask for more if she is still hungry.
- Offer your child food every 2 to 3 hours for a meal or snack.

## ***What can I do about my picky eater?***

- Look at your child's eating over time rather than at each meal. If your child is energetic and growing, he is probably eating enough.
- Offer a variety of healthy foods, and encourage your child to try different ones.
- Continue to serve a food even if your child has rejected it.
- Let your child participate in food shopping and preparation.
- Do not use food to reward, bribe, or punish your child.

### **My child sometimes dawdles during meals. What can I do?**

- It is normal for children to lose interest in an activity, including eating, after a short time. They are also easily distracted. Try to reduce distractions (eg, turn off the television) during meals and snacks.
- Routines are important to children. Schedule meals and snacks.

### **My child wants to eat only peanut butter sandwiches. What should I do?**

- Food jags (when children want to eat only a particular food) are common in young children.
- Offer smaller servings of the favored food, along with other foods, to ensure that your child eats a variety of foods.
- Jags rarely last long enough to be harmful. If your child is energetic and growing, he is probably eating enough.

### **How can I get my child to try new foods?**

- Offer small portions of new foods—perhaps 1 or 2 tablespoons—and let your child ask for more.
- Encourage your child to try a new food, but don't force her to eat it. Continue to serve a food even if your child has rejected it. It may take several times before she accepts the food.
- Serve your child's favorite foods along with new foods. She may be more willing to try new foods if her favorites are on her plate.
- Be a positive role model—eat new foods yourself.
- Introduce a new food in a neutral manner. Talk about the food's color, shape, aroma, and texture, but don't talk about whether it tastes good.
- Make trying new foods appealing by involving your child in shopping and preparing the food.

### **What should my child drink?**

- Your child should drink about 2 cups (16 oz) of milk per day. Drinking more than this can reduce your child's appetite for other healthy foods.
- Until age 2, serve your child whole milk. Your child needs the extra fat in whole milk for growth and development.

- For children older than age 2, low-fat (1%) or fat-free (skim) milk is recommended.
- Offer 100% fruit juice in small amounts, about 4 to 6 oz per day.
- Serve juice in a cup, not a bottle. Juice served in a bottle can cover your child's teeth with sugar for long periods of time and contribute to tooth decay.
- Your child may not tell you when he is thirsty. Make sure he drinks plenty of water throughout the day, especially between meals and snacks.

### **How can I help my child get enough calcium?**

- Serve foods that are rich in calcium, such as milk, cheese, yogurt, tofu processed with calcium sulfate, broccoli, and collard and turnip greens.
- Use milk products in recipes, such as in puddings, milkshakes, soups, and casseroles.
- Serve yogurt.
- If your child is lactose intolerant (that is, her digestive system cannot handle larger quantities of milk and other milk products), try these suggestions
  - Serve small portions of these foods throughout the day.
  - Serve these foods along with non-milk products.
  - Serve lactose-free milk products, yogurt, and aged hard cheeses, such as cheddar, Colby, Swiss, and Parmesan, which are low in lactose. Add lactase drops to your child's milk.
  - Give your child lactase tablets before she eats milk products containing lactose.
  - Serve calcium-fortified foods (foods that have added calcium), such as orange juice and cereal products.
- If these suggestions do not work, ask a health professional about giving your child a calcium supplement.

### **Should I give my child a vitamin and mineral supplement?**

- If your child is growing and eats a variety of healthy foods, he does not need a vitamin and mineral supplement.
- Talk to a health professional if you are considering giving your child a vitamin and mineral supplement.

- Depending on your child's risk for developing tooth decay and the known level of fluoride in your child's drinking water, the dentist or physician may recommend giving your child a fluoride supplement.
- If your child does take a supplement, keep the bottle out of his reach. The supplements may look and taste like candy, and consuming too many at once can be harmful.
- Limit your child's total entertainment media time (eg, watching television, playing computer or video games) to 1 to 2 hours of quality programming per day. Don't put a television in your child's bedroom; if one is already there, remove it.
- Serve scheduled meals and snacks.
- Do not forbid sweets and desserts. Serve them in moderation.

### **What should I do if my child is overweight?**

- Bring into the house only foods that you want your child to eat. Avoid buying high-calorie, low-nutrient foods in large quantities or on a regular basis.
- Never place your child on a diet to lose weight, unless a health professional recommends one for medical reasons and supervises it.
- If your child is growing, eats healthy foods, and is physically active, you do not need to worry about whether she is overweight. However, if you have any concerns about your child's weight, talk with your child's health professional.
- Have your child's health professional check to make certain your child does not have any health problems.
- Allow your child to serve herself food, and help her learn to recognize internal hunger and fullness cues. When children are hungry, they may be irritable or tired or have difficulty focusing on a task. When they are full, they will begin eating more slowly or stop eating. Less subtle but equally important cues are ones that demand your attention, such as throwing food or utensils and playing with food.
- Let your child know that people come in many sizes and shapes and that you love her as she is. Never criticize your child's size, weight, or shape.
- If others comment on your child's size, weight, or shape, redirect their comments to your child's other attributes.
- Be a role model—practice healthy eating behaviors, and engage in regular physical activity.
- If your child does not eat enough healthy food or engage in enough physical activity, focus on gradually changing the entire family's eating behaviors and physical activity practices instead of singling out those of the child.
- Plan family activities that everyone enjoys (eg, hiking, biking, swimming).

### **How can I help my child like her body?**

- Be a positive role model—don't criticize your own size or shape or that of others.
- Focus on traits other than appearance when talking to your child.

### **Should my child eat low-fat foods?**

- Reduced-fat (2%), low-fat (1%), and fat-free (skim) milk are not recommended for children younger than age 2, because infants and young children need fat for growth and development.
- After age 2, children should gradually increase the proportion of low-fat foods in their diets. As they begin to consume fewer calories from fat, children need more whole-grain breads and cereals, fruits and vegetables, low-fat or fat-free milk, lean meats, and other high-protein foods.
- Fatty fish, such as salmon, trout, and albacore tuna, are important for young children to eat.
- It is important for children to consume enough calories to grow well. When children are very active or having a growth spurt, their energy needs may be higher.

### **How can I prevent my child from choking?**

- Have your child sit while eating. Eating while walking or running may cause him to choke.
- Keep things calm at mealtimes and snack times. If your child becomes overexcited, he may choke.

- Do not let your child eat in a moving car. If he chokes while you are driving, you will not be able to help him.
- For children younger than age 3, avoid foods that may cause choking (eg, hard candy, mini-marshmallows, popcorn, pretzels, chips, spoonfuls of peanut butter, nuts, seeds, large chunks of meat, hot dogs, raw carrots, raisins and other dried fruits, whole grapes).
- Children ages 3 to 5 may eat these foods if they are modified to make them safer (eg, cutting hot dogs in quarters lengthwise and then into small pieces, cutting whole grapes in half lengthwise, chopping nuts finely, chopping raw carrots finely or into thin strips, spreading peanut butter thinly on crackers or bread).
- Use a safety belt when your child rides in a shopping cart.
- Bring toys to keep your child busy.
- Set clear rules for behavior (eg, no climbing out of the cart, no asking for candy), and praise your child for following the rules.
- Ask your child to help you look for food items.
- Talk to your child about what you are buying.
- If possible, do not rush your child. Children love to look around and discuss what they see.

### **What can I expect my child to do as he grows?**

Although the skills listed are attainable for most children, some children—especially those with development disabilities—may not be able to master the skills at the ages indicated.

*At ages 12–18 months, your child will*

- Grasp and release foods with his fingers.
- Be able to hold a spoon (but will not be able to use it very well).
- Be able to use a cup (but will have difficulty letting go of it).
- Want foods that others are eating.

*At ages 18–24 months, your child will*

- Eat less than infants and than children ages 2 and older.
- Like to eat with his hands.
- Have favorite foods.
- Get distracted easily.

*At ages 2–3, your child will*

- Be able to hold a cup.
- Begin to place foods on own plate.
- Be able to chew more foods.
- Have definite likes and dislikes.

*At age 3–4, your child will*

- Be able to use a fork.
- Be able to hold a cup by its handle.
- Be able to pour liquids from a small pitcher.
- Request favorite foods.
- Like foods in various shapes and colors.
- Like to imitate the cook.
- Be influenced by television.

*At ages 4–5, your child will*

- Be able to use a knife and fork.
- Be able to use a cup well.
- Be able to feed himself.
- Be able to serve foods to herself.
- Be more interested in talking than in eating.

### **How can I encourage my child to be more physically active?**

- Encourage active, spur-of-the-moment play (eg, jumping, hopping, skipping).
- Find acceptable indoor activities (eg, marching, dancing, tossing a bean bag).
- Play together (eg, dance, play hide and seek, kick a ball). It's a great way to spend time with your child.
- Limit your child's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day. Don't put a television in your child's bedroom; if one is already there, remove it.
- For every hour your child reads, watches television, or plays computer or video games, encourage her to take a 10-minute physical activity or stretch break.
- Involve your child in family chores (eg, raking leaves, walking the dog).
- Plan at least one special physical activity (eg, a hike, a bike ride) each week.
- Work with community leaders to ensure that your child has safe places for engaging in physical activity (eg, walking and biking paths, playgrounds, parks, community centers).

### **What can I do to make grocery shopping with my child pleasant?**

- Go shopping when neither you nor your child is hungry.
- Make a list in advance to save time while shopping.

- Continue to have food jags (when he only wants to eat a particular food).
- Like to help prepare food.
- Be interested in where food comes from.
- Be more influenced by his peers.

### RESOURCES FOR FAMILIES

Centers for Disease Control and Prevention. *Division of Nutrition, Physical Activity and Obesity*. <http://www.cdc.gov/nccdphp/dnpa>

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# Middle Childhood







# Middle Childhood

## CONTEXT

Middle childhood (ages 5–10) is characterized by a slow, steady rate of physical growth. However, cognitive, emotional, and social development occur at a tremendous rate during this period of a child's life.

To achieve optimal growth and development, children need to eat a variety of healthy foods that provide sufficient energy, protein, carbohydrates, fat, vitamins, and minerals. They need 3 meals per day, plus 1 or 2 snacks.

Children benefit greatly from practicing healthy eating behaviors. These behaviors are essential for

- Promoting optimal growth, development, and health
- Preventing immediate health problems (eg, iron-deficiency anemia, overweight and obesity, undernutrition, eating disorders, dental caries [tooth decay])
- Laying the foundation for lifelong health and reducing the risk for chronic diseases (eg, cardiovascular disease, type 2 diabetes mellitus, hypertension, some forms of cancer, osteoporosis)

## GROWTH AND PHYSICAL DEVELOPMENT

Middle childhood's slow, steady rate of growth continues until the onset of puberty, which occurs in late middle childhood or early adolescence. During middle childhood, children gain an average of 7 lbs in weight, 2½ inches in height, and 1 inch in head circumference per year. They have growth spurts, which are usually accompanied by an increase in appetite and food intake. Conversely, a child's appetite and food intake decrease during periods of slower growth.

Body mass index (BMI) changes substantially during middle childhood. After age 2, BMI-for-age begins to decline, and it continues to decrease during the preschool years until it reaches its lowest point at around ages 5 to 6. Subsequently, BMI-for-age begins a gradual increase that is sustained through adolescence and into adulthood. The rebound or increase in BMI that occurs after it reaches its lowest point is referred to as BMI rebound and is reflected in the BMI-for-age and gender growth curves. This is a normal pattern of growth that occurs in all children. However, an early BMI rebound (occurring before ages 5–6), may be associated with obesity in adulthood.<sup>1</sup>

Body composition and body shape remain relatively constant during middle childhood. During preadolescence in girls (ages 9–11) and early adolescence in boys (ages 10–12), body fat percentage increases in preparation for the growth spurt that occurs during adolescence. In girls, the amount of the increase is greater than in boys. During preadolescence or early adolescence, girls in particular (but also boys) may appear “chunky,” but this is part of normal growth and development. During middle childhood, boys have more lean body mass per inch of height than girls do.



During middle childhood, children may become overly concerned about their appearance. Girls especially may worry that they are overweight and may begin to eat less or diet. Parents should be aware of this possibility so that they can reassure their child that an increase in body fat during middle childhood is part of normal growth and development and is probably not a permanent change. Boys may become concerned about their stature and muscle size and strength. Parents and children should be aware that muscle-building activities (eg, weightlifting) during this period can be harmful. Boys are unable to increase their muscle mass until middle adolescence although, with appropriate physical activity, they can improve their muscle strength. Most children begin to lose their primary teeth during middle childhood, and permanent teeth begin to erupt. When children are missing several teeth or are undergoing orthodontic treatment, it may be difficult for them to chew certain foods, such as meat. Offering chopped meats and softer foods can help ensure that children are able to eat a healthy diet.

### DEVELOPMENT ISSUES

In the early stages of middle childhood, children describe foods according to color, shape, and quantity and classify foods as ones they like and don't like. They may be able to identify foods that are healthy but may not know why they are healthy. As children mature, they begin to realize that eating healthy food has a positive effect on growth and health.

Children in middle childhood begin to develop a sense of self and to learn their roles in the family, at school, and in the community. Their ability to feed themselves improves, they can help with meal planning and food preparation, and they can perform tasks related to mealtime. Performing these tasks enables children to contribute to the family, thereby boosting their self-esteem.

During middle childhood, mealtimes take on more social significance, and outside sources (eg, peers, the media) begin to exert more influence over children's attitudes toward eating behaviors and food. In addition, children eat more meals away from home (eg, at child care

facilities, at school, and at the homes of friends and relatives). The degree to which they are willing to eat certain foods and to participate in nutrition programs (eg, the National School Lunch Program) may be influenced by what their friends are doing.

Parents continue to have the most influence on children's eating behaviors and attitudes toward food. Parents need to make healthy foods available at home and to limit the availability of high-calorie, low-nutrient foods. Parents should be positive role models by practicing healthy eating behaviors themselves. Children's food intake is strongly associated with what their parents eat.

It is important for families to eat meals together in a pleasant environment, allowing time for social interaction and family togetherness. This can become more difficult as children get more involved in extracurricular activities. Children who eat dinner with their families have a higher-quality diet, including greater intake of fruits, vegetables, milk products, vitamins, and minerals, and decreased soft drink consumption.<sup>2</sup> The proportion of children that eat dinner with their families decreases with the age of the child, and eating as a family becomes more challenging as children approach adolescence.<sup>2</sup>

Many children walk to neighborhood stores and fast-food restaurants and purchase food with their own money. Parents need to provide guidance to help children make healthy food choices away from home.

### HEALTHY LIFESTYLES

Children can achieve substantial health benefits by doing moderate- and vigorous-intensity physical activity for a total of 60 minutes or more each day. This should include aerobic activity as well as age-appropriate muscle- and bone-strengthening activities. It appears that the total amount of physical activity is more important for achieving health benefits than any one component (frequency, intensity, or duration) or the specific mix of activities (aerobic, muscle strengthening, or bone strengthening). Even so, bone-strengthening activities remain especially important for children because the greatest gains in bone mass occur during the years just before and during puberty.<sup>3</sup>

Children who are physically active

- Have higher levels of cardiorespiratory fitness and stronger muscles
- Typically have less body fat
- Have stronger bones
- May have reduced symptoms of anxiety and depression

During middle childhood, children’s muscle strength, motor skills, and stamina increase. Children acquire the motor skills necessary to perform complex movements, allowing them to engage in a variety of physical activities.

Children are motivated to be physically active by having fun, feeling competent, and engaging in a variety of activities.

Parents play a major role in determining children’s physical activity levels. By being physically active (eg, biking, hiking, playing basketball or baseball) with their child, parents emphasize the importance of regular physical activity and show their child that physical activity can be fun. When parents encourage children to be physically active, children’s physical activity levels significantly increase.<sup>4</sup>

Physical education at school should be provided every day, and enjoyable activities should be offered. Teachers and children’s friends influence a child’s level of physical activity. Children may be more interested in activities in which their friends are engaging. Participating in physical activity programs helps children learn to cooperate with others.

Middle childhood is an appropriate time to begin discouraging children from using tobacco products and drinking alcohol.

### BUILDING PARTNERSHIPS

Middle childhood provides an opportunity for health professionals, families, and communities to teach children about healthy eating behaviors, encourage positive attitudes toward food and eating, and promote regular physical activity.

Health professionals can give parents the opportunity to discuss nutrition issues and concerns about their children and can identify and contact community resources to help parents feed their children.

Children need a variety of healthy foods served in a pleasant environment. Nutrition education should be part of the education curriculum, and child care facilities and schools should serve a variety of healthy foods that children learn about in the classroom. Federally funded school meal programs help provide children with a substantial part of their daily nutrient requirements. (See Tool K: Federal Nutrition Assistance Programs.) Food shelves and pantries, community groups, and faith-based organizations can also provide food.

Communities need to provide physical activity programs (eg, at child care facilities, schools, recreation centers) and safe places for children to play.

### COMMON NUTRITION CONCERNS

Common nutrition concerns during middle childhood include the following:

- Decrease in consumption of milk and milk products
- Increase in consumption of sweetened beverages, especially soft drinks
- Limited intake of fruits and vegetables
- Higher consumption than recommended of foods high in fat, especially saturated and trans fats
- Rise in overweight and obesity
- Increase in body image concerns

There are many barriers that may prevent children from eating healthy foods and being physically active. Some children do not have opportunities to be physically active, and some live in unsafe neighborhoods. Children who experience poverty or neglect may lack access to the foods they need to stay healthy. Foods that are high in sugar and fat, especially those high in saturated and trans fats, are readily available, and media messages encourage children to eat them. A study of commercials aired during children’s television programming on Saturday morning showed that almost 50% of commercials focus on food, with 9 out of 10 of these commercials focusing on foods that are high in fat, sodium, or added sugars or low in nutrients.<sup>5</sup> Children who use the Internet are subjected to food marketing in new forms, such as “advergaming” (online games that feature a company’s product or brand character) or “advercation” (a combination of advertising and education).<sup>6</sup>

For a list of risk factors that can lead to poor nutrition status, see Tool D: Key Indicators of Nutrition Risk for Children and Adolescents. If there is evidence that a child is at risk for poor

nutrition, further assessment is needed, including a nutritional assessment, laboratory tests, or both.

## Nutrition Supervision

A child's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. (For more information on health supervision, see *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, Third Edition, listed under Suggested Reading in this chapter.) It is important to remember that nutrition supervision, which includes asking interview questions, conducting screening and assessment, and providing anticipatory guidance, should be used as appropriate and will vary from visit to visit and from child to child.

Health professionals begin nutrition supervision by selectively asking interview questions about the child's nutrition status, to invite discussion and build partnerships. Use of the questions may vary from visit to visit and from family to family. Questions can be modified to match the health professional's communication style. Gathering information can also be accomplished by reviewing a questionnaire filled out by parents before the visit. (See Tool B: Nutrition Questionnaire for Children Ages 1 to 10.) Additionally, to meet the challenge of providing nutrition supervision to diverse populations, health professionals need to appreciate the variety of cultural traditions related to food and the wide variation in food practices within and among cultural groups. (See the Cultural Awareness in Nutrition Services chapter.) Asking interview questions provides a useful starting point for identifying a child's nutrition concerns.

### Interview Questions

#### *Eating Behaviors and Food Choices*

##### FOR THE CHILD

- Which meals do you usually eat each day?  
How many snacks?
- How often does your family eat meals together?

- Where did you eat yesterday? At school?  
At home? At a friend's house?
- What do you usually eat and drink in the morning? Around noon? In the afternoon?  
In the evening? Between meals?
- What snacks do you usually eat?
- What is your favorite food?
- Are there any foods you won't eat? If so, which ones?
- What do you usually drink with your meals?  
With snacks?
- What fruits and vegetables, including juices, did you eat or drink yesterday?

##### FOR THE PARENT

- How often does your family eat meals together?
- Do you have any concerns about your child's eating habits or behaviors (eg, getting her to drink enough milk)?
- Do you think your child eats healthy foods? Why or why not?
- How often does your child eat breakfast?
- What does he usually eat for snacks?
- Where does your child eat snacks?  
At home? At school? At after-school care?  
At a friend's house?
- What does he usually drink (eg, milk, water, fruit juice, fruit drinks, soft drinks)?

#### *Food Resources*

##### FOR THE CHILD OR PARENT

- Who usually buys the food for your family?  
Who prepares it?
- Are there times when there is not enough food to eat or not enough money to buy food?

#### *Weight and Body Image*

##### FOR THE YOUNGER CHILD

- How do you feel about your weight?

**FOR THE OLDER CHILD**

- How do you feel about your weight?
- How much would you like to weigh?
- Are you trying to change your weight?  
If so, how?

**FOR THE PARENT**

- How do you feel about your child's weight?

**Physical Activity****FOR THE CHILD**

- What do you do to be physically active?  
How often?
- How much time do you spend being active in a week?
- How much time do you spend each day watching television and playing computer or video games?
- What do you think you can do to be more active?

**FOR THE PARENT**

- What types of physical activity does your child engage in? How often?
- How much time does your child spend each day watching television or playing computer or video games?
- Does your child have a television in his bedroom?

**Screening and Assessment****Growth and Physical Development**

- Measure the child's height and weight, and plot these on a standard growth chart. Deviation from the expected growth pattern (eg, a major change in growth percentiles on the chart) should be evaluated. This may be normal or may indicate a nutrition problem (eg, difficulties with eating).

- Height and weight measurements can be used to indicate nutrition and growth status. Changes in weight reflect a child's short-term nutrient intake and serve as general indicators of nutrition status and overall health. Low height-for-age may reflect long-term, cumulative nutrition or health problems.

- Body mass index is used as a screening tool to determine nutrition status and overall health. Calculate the child's BMI by dividing weight by the square of height ( $\text{kg}/\text{m}^2$ ) or using a BMI wheel or calculator. To interpret BMI, plot the child's BMI and age on a BMI-for-age growth chart to determine the child's BMI percentile.
- Some children may have a high BMI percentile because of a large, lean body mass resulting from physical activity, muscularity, or frame size. An elevated skinfold (ie, above the 95th percentile on growth charts) can confirm excess body fat in children.
- Evaluate the appearance of the child's skin, hair, teeth, gums, tongue, and eyes.
- Obtain the child's blood pressure. (See the Hypertension chapter.)
- Assess the child's risk for familial hyperlipidemia. (See the Hyperlipidemia chapter.)

Table 1 provides an overview of indicators of height and weight status. When a child is outside the healthy weight range, a more in-depth assessment may be needed. Body mass index serves only as a screening tool and should not be used as a diagnostic tool.

**TABLE 1. INDICATORS OF HEIGHT AND WEIGHT STATUS**

Indicator	Anthropometric Variable	Cut-Off Values
Stunting	Height-for-age	<3rd percentile
Underweight	BMI-for-age	<5th percentile
Healthy weight	BMI-for-age	≥5th–84th percentiles
Overweight	BMI-for-age	≥85th–94th percentiles
Obesity	BMI-for-age	≥95th percentile

Sources: World Health Organization,<sup>7</sup> Barlow et al,<sup>8</sup> and Krebs et al.<sup>9</sup>

### **Stunting**

- Children whose height-for-age is below the third percentile should be evaluated. Stunting reflects a failure to reach optimum height as a result of poor nutrition or poor health.<sup>7</sup> Most children with low height-for-age are short as a result of genetics, not because their growth is stunted. Stunting has been reported in children with severely inadequate energy intakes or chronic illnesses. The goal is to identify children whose growth is stunted and who may benefit from improved nutrition or treatment of other underlying problems. Children with special health care needs may have low height-for-age because of a genetic disorder, chronic eating problems, an altered metabolic rate, malabsorption syndrome, or other conditions. All of these factors should be assessed, and interventions should be implemented to help children reach the height that they have the potential to achieve. A referral to an endocrinologist may be necessary to rule out growth hormone or thyroid deficiency.

### **Underweight**

- Children with a BMI below the fifth percentile should be assessed for organic disease and eating disorders. Children may be thin naturally, or they may be thin as a result of inadequate energy intake, inadequate food resources, restrictive dieting, a nutritional deficit, or a chronic disease.

### **Overweight**

- Children with a BMI between the 85th and 94th percentiles are considered overweight and need further screening.<sup>8</sup> (See the Obesity chapter.)

### **Obesity**

- Children with a BMI at or above the 95th percentile are considered obese and need an in-depth medical assessment.<sup>9</sup> Children with a BMI at or above the 99th percentile are at highest risk for comorbidities associated with excessive weight. However, there is no consensus on a definition of severe obesity in children. The expert committee suggested using the 99th percentile based on cutpoints from National Health and Nutrition Examination Survey data.<sup>10</sup> These cutpoints may be

imprecise, but children with a BMI at or above this level are at higher risk for comorbidities compared with children with BMIs in the normal range, and therefore intervention is urgent. (See the Obesity chapter.)

### **Iron-Deficiency Anemia**

- Recommendations for iron-deficiency anemia screening have been put forth by the American Academy of Pediatrics (AAP) and the Centers for Disease Control and Prevention (CDC). (See the Iron-Deficiency Anemia chapter.)
  - The AAP recommends screening children who are consuming a strict vegetarian diet without iron supplementation.<sup>11</sup>
  - The CDC recommends screening children with known risk factors for iron-deficiency anemia (eg, low iron intake, special health care needs, previous diagnosis of iron-deficiency anemia).<sup>12</sup>

### **Oral Health**

- Ask whether the child has regular dental visits.
- Assess eating behaviors (eg, frequency of consuming foods and beverages high in sugar) to determine the child's risk for dental caries (tooth decay). (See the Oral Health chapter.)

### **Physical Activity**

- Assess the child's level of physical fitness by
  - Asking how much physical activity the child engages in on a weekly basis
  - Evaluating how the child's physical fitness compares to national standards (eg, how well the child did on the school's standardized physical fitness assessment)
  - Evaluating the child's motor skills and appropriateness of physical activities (Table 2)
- For physical activity characteristics associated with an increased likelihood of poor nutrition, see Tool D: Key Indicators of Nutrition Risk for Children and Adolescents. If there is evidence of nutrition risk, further assessment should be conducted, including a nutrition assessment, laboratory tests, or both.
- Screen for the amount of time the child spends watching television and on other media activities, such as computer or video games. Ask whether the child watches television during mealtimes.

TABLE 2. MOTOR SKILLS DEVELOPMENT AND APPROPRIATE PHYSICAL ACTIVITY

Ages	Motor Skills	Recommended Physical Activities
5–6	Fundamental (eg, running, galloping, jumping, hopping, skipping, throwing, catching, kicking)	Focus on having fun and developing motor skill rather than on competition Are simple activities that require little instruction Are repetitive and do not require complex motor and cognitive skills (eg, running, swimming, tumbling, throwing and catching a ball)
7–9	Fundamental transitional (eg, throwing for distance, throwing for accuracy)	Focus on having fun and developing motor skill rather than on competition Have flexible rules Require little instruction Do not require complex motor and cognitive skills (eg, entry-level baseball, soccer)
10–11	Transitional complex (eg, playing basketball)	Focus on having fun and developing motor skill rather than on competition Require entry-level complex motor and cognitive skills Continue to emphasize motor skill development but begin to incorporate instruction on strategy and teamwork

Source: Patrick et al.<sup>13</sup>

### Anticipatory Guidance

Anticipatory guidance should address the child's and parents' nutrition concerns. In addition, health professionals should offer information on the child's nutrition status; make the child and parents aware of what to expect as the child enters the next developmental period; and promote a positive attitude about eating behaviors, food choices, and physical activity. (For additional information, see Tool F: Stages of Change—A Model for Nutrition Counseling, and Tool G: Strategies for Health Professionals to Promote Healthy Eating Behaviors.)

#### Growth and Physical Development

- Discuss physical development with the child and parents, including the approximate times when they should expect accelerated growth. For girls, this may occur at ages 9 to 11; for boys, it may occur at ages 10 to 12.
- Explain the standard growth chart to the child and parents, and discuss how the child compares to others his age. Emphasize that a healthy body weight is based on a genetically determined size and shape rather than on an ideal, socially defined weight. (See Tool I: Tips for Fostering a Positive Body Image Among Children and Adolescents.)
- Tell the child and parents what a healthy weight is. Help the child understand that people come in unique sizes and shapes,

within a range of healthy body weights. All children need to know they are loved and accepted by their families as they are, regardless of their size and shape.

- Explain to children that some of their peers may start puberty earlier or later than they do, but that they are still normal.
- Discuss with the child and parents the physical changes that the child can expect to experience in the near future, as well as specific concerns.
- Emphasize to the child and parents the importance of eating healthy foods and being physically active to achieve or maintain a healthy weight.
- Explain to the child and parents that weight loss should not occur in children with a BMI below the 95th percentile, but a gradual weight loss of no more than 1 lb a month may be appropriate for children with a BMI between the 95th and 99th percentiles. For children with a BMI above the 99th percentile, a maximum of 2 lbs a week may be appropriate. But, even if they are losing weight, children need to consume sufficient calories and nutrients for growth and development.<sup>8</sup>

#### Eating Behaviors and Food Choices

- Discuss with the child and parents the importance of healthy eating. Provide guidance to the child on increasing the variety of foods she eats and guidance to parents on incorporating new foods into their child's diet.

- Encourage the child to make healthy food choices based on the *Dietary Guidelines for Americans*<sup>14</sup> and on *MyPyramid*.<sup>15</sup> (See the Healthy Eating and Physical Activity chapter.) For example, encourage the child to eat fruits, vegetables, grain products (especially whole grain), low-fat and fat-free milk products (eg, milk, cheese, yogurt), lean meats, poultry, fish, beans, eggs, and nuts.
  - Explain to parents that energy requirements remain fairly constant during middle childhood and are influenced by growth, physical activity level, and body composition. Boys and girls need approximately the same number of calories per day until the beginning of their growth spurts, when calorie needs increase. Dietary Reference Intakes provide energy requirements based on activity levels. Children who are very active require more calories than children who are less active.<sup>16,17</sup>
  - Tell parents that children ages 2 to 8 need to drink 2 cups of low-fat (1%) or fat-free (skim) milk or consume the equivalent from other milk products (eg, yogurt, cheese) per day to meet their calcium needs. Eating foods that provide enough calcium, such as milk, yogurt, and cheese, to attain maximum bone density helps prevent osteoporosis and bone fractures later in life.
  - Tell parents that children ages 9 and older need to drink 3 cups of low-fat (1%) or fat-free (skim) milk or consume the equivalent from other milk products (eg, yogurt, cheese) per day to meet their calcium needs.
  - Tell parents that to prevent rickets and vitamin D deficiency, children who do not obtain 400 IU/day of vitamin D through vitamin D–fortified milk (100 IU per 8-oz serving) and vitamin D–fortified foods (eg, fortified cereals, eggs [yolk]) should receive a vitamin D supplement of 400 IU/day.<sup>18</sup>
  - Emphasize to parents that children need to eat regular healthy meals and snacks. Discuss the importance of having regular family meals.
  - Tell parents that children in middle childhood cannot consume large amounts of food at one time and therefore need 1 to 2 snacks daily to ensure that they are eating a healthy diet. Help children choose healthy snacks rich in complex carbohydrates (eg, whole-grain products, fresh fruits and vegetables).
  - Encourage parents to limit foods high in fat, especially those high in saturated and trans fats (eg, chips, french fries), and foods (eg, candy, cookies) and beverages (eg, fruit drinks, soft drinks) high in sugar.
  - Encourage parents to promote drinking water when their child is thirsty and to limit intake of juice and sweetened beverages.
  - Discuss with parents that children should be offered healthy choices at meals. Mealtimes at home, school, restaurants, and other places can be used to teach children to make healthy food choices.
  - Encourage parents to provide a relaxed atmosphere for mealtimes and to get rid of distractions such as the television. Well-balanced meals and snacks should be offered in a pleasant environment. When children are stubborn about eating, it is often their way of learning to be independent. Fighting over food may make them even more stubborn.
  - Encourage parents to enroll their child in school breakfast and lunch programs if needed. (See Tool K: Federal Nutrition Assistance Programs.)
- ### Oral Health
- 
- Explain to parents that toothbrushing requires good fine motor control and that young children cannot clean their teeth without parental help. After children acquire fine motor skills (eg, the ability to tie their shoelaces), typically by age 7 or 8, they can clean their teeth effectively.
  - Encourage the child to brush his or her teeth with fluoridated toothpaste twice a day (after breakfast and before bed).
  - Tell parents that limiting their child's consumption of foods (eg, candy, cookies) and beverages (eg, fruit drinks, soft drinks) high in sugar can help prevent dental caries (tooth decay).
  - Explain to parents that drinking fluoridated water is a safe and effective way to significantly reduce the risk for dental caries (tooth decay) in children. (See the Oral Health chapter.) For families that prefer bottled water, a brand in which fluoride is added at a concentration of approximately 0.8 to 1.0 mg/L (ppm) is recommended.<sup>19</sup>

### ***Physical Activity***

- Encourage the child to engage in 60 or more minutes of daily physical activity. Explain to the child the following guidelines:<sup>3</sup>
  - Aerobic: Most of the 60 or more minutes or more a day should be either moderate-intensity (eg, hiking, skateboarding) or vigorous-intensity (eg, running, bicycling) aerobic physical activity and should include vigorous-intensity physical activity at least 3 days a week.
  - Muscle-strengthening: As part of the 60 or more minutes of daily physical activity, children should include muscle-strengthening physical activity (eg, climbing trees, sit-ups) at least 3 days a week.
  - Bone-strengthening (weight-bearing): As part of their 60 or more minutes of daily physical activity, children should include bone-strengthening physical activity (eg, jumping rope, playing basketball) at least 3 days a week.
- Encourage parents of children with special health care needs to allow their child to engage in regular physical activity for cardiovascular fitness (within the limits of the child's medical or physical conditions). Explain that adaptive physical education is often helpful and that a physical therapist can help identify appropriate activities for the child with special health care needs. (See the Children and Adolescents With Special Health Care Needs chapter.)
- Emphasize to the child and parents the importance of physical activity. Encourage the older child to stay active during adolescence, when physical activity tends to decline.
- Encourage the child to find physical activities he enjoys and can incorporate into his daily life. These activities tend to be continued into adulthood.
- Emphasize to the child and parents the importance of wearing safety equipment (eg, helmets, pads, mouth guards, goggles) when the child is physically active. Also, suggest that the parent check surfaces under playground equipment to ensure that materials such as mulch chips, pea gravel, fine sand, or shredded rubber are present to cushion a fall.
- If the safety of the environment or neighborhood is a concern, help parents and the child find other settings for physical activity.
- Explain to parents that most elementary schools include physical education in their curricula and that school physical education programs usually conduct physical fitness testing when children are in middle childhood. Encourage parents to bring the results of their child's fitness testing to discuss results as well as suggestions for improvement.
- Tell parents that for children who engage in organized sports, adequate fluid intake is very important. Before puberty, children are at increased risk for heat-related illness because their sweat glands are not fully developed, and they cannot cool themselves as well as adolescents or adults can. Encourage parents to make sure that their child drinks adequate fluids. (See the Healthy Eating and Physical Activity chapter.)
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes and not have a television in the child's bedroom. Limit the child's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day.<sup>20</sup>
- Encourage the child, especially if she is overweight or obese, to reduce sedentary behaviors.

### ***Substance Use***

- Warn parents and the child about the dangers of alcohol, tobacco, and other drugs.
- Warn parents and the child about the dangers of performance-enhancing products (eg, protein supplements, anabolic steroids).

The desired outcomes for the child and the role of the family outlined in Table 3 can assist health professionals in promoting optimal nutrition.

**TABLE 3. DESIRED OUTCOME FOR THE CHILD, AND THE ROLE OF THE FAMILY**

	<b>Educational/Attitudinal</b>	<b>Behavioral</b>	<b>Health</b>
<b><i>Desired Outcomes for the Child</i></b>	<p>Understands that healthy eating behaviors and regular physical activity are crucial to growth, development, and health</p> <p>Understands the importance of eating a variety of healthy foods and how to increase food variety</p> <p>Understands the importance of a healthy diet consisting of 3 meals per day and 1 to 2 snacks as needed</p> <p>Understands the physical, emotional, and social benefits of physical activity and how to increase physical activity level</p> <p>Understands that people come in unique body sizes and shapes, within a range of healthy body weights</p>	<p>Consumes a variety of healthy foods</p> <p>Makes healthy food choices at and away from home</p> <p>Engages in at least 60 minutes of physical activity on most, and preferably all, days of the week</p> <p>Watches television or plays computer or video games no more than 1 to 2 hours of quality programming a day</p>	<p>Maintains optimal nutrition to promote growth and development</p> <p>Achieves nutritional and physical well-being, without signs of iron-deficiency anemia, undernutrition, obesity, eating disorders, dental caries (tooth decay), or other nutrition-related problems</p> <p>Achieves and maintains a healthy body weight and positive body image</p>
<b><i>Role of the Family</i></b>	<p>Understands physical changes that occur with growth and development</p> <p>Understands the relationship between nutrition and short- and long-term health</p> <p>Understands children’s eating behaviors and how to increase the variety of healthy foods they eat</p> <p>Understands the importance of a healthy diet consisting of 3 meals per day and snacks as needed</p> <p>Understands the importance of family meals</p> <p>Understands that people come in unique body sizes and shapes, within a range of healthy body weights</p> <p>Understands the dangers of unsafe weight-loss methods and knows safe ways to achieve and maintain a healthy weight</p>	<p>Provides a positive role model: practices healthy eating behaviors, engages in regular physical activity, and promotes a positive body image</p> <p>Provides a variety of healthy foods at home, and limits the availability of high-sugar and high-fat foods, especially those high in saturated and trans fats</p> <p>Eats meals together regularly to ensure optimal nutrition and facilitate family communication</p> <p>Provides opportunities for the child to participate in meal planning and food preparation</p> <p>Uses nutrition programs and food resources if needed</p> <p>Engages in regular physical activity with the child</p>	<p>Provides developmentally appropriate, healthy foods and modifies them if necessary</p> <p>Helps the child achieve and maintain a healthy weight</p> <p>Provides opportunities and safe places for the child to engage in physical activity</p>

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# The Importance of Healthy Snacks

Melanie Walker is a 6-year-old who has just started first grade. She eats breakfast at home and participates in the school lunch program at her elementary school, where she eats lunch every day at 11:00 am. The school does not have a regularly scheduled snack in the afternoon. By the time Melanie gets home from school at around 3:30 pm, she is hungry, tired, and cranky.

Last year Melanie attended a morning kindergarten class and spent 3 afternoons a week at a child care facility. At the time she was eating breakfast at home, a snack at 9:30 am, lunch at 11:30 am, and another snack at 3:00 pm. Melanie didn't seem to

be as hungry, tired, or cranky at the end of the afternoon as she is now.



*Mr and Mrs Walker share their concerns with the teacher and the principal. As a result, the school authorizes a regular afternoon snack for children who eat lunch early.*



Melanie's parents talk with a nutritionist who suggests that they meet with the teacher and the principal to discuss adding an afternoon snack. Mr and Mrs Walker and the parents of other children in Melanie's class share their concerns with the teacher and the principal during an after-school meeting, and the nutritionist shares information on the importance of healthy snacks in children's diets.

As a result, the school authorizes a regular afternoon snack for children who eat lunch early.

# Frequently Asked Questions About Nutrition in Middle Childhood

## ***How can I encourage my child to eat healthy foods?***

- Serve new foods and regional and ethnic foods.
- Shop for foods and cook together.
- Be a positive role model—practice healthy eating behaviors yourself.
- Don't fight over food with your child, and do not prepare separate foods for him.
- Avoid using food as part of a reward system.
- Keep a variety of healthy foods in the house. Limit the availability of foods (eg, candy, cookies) and beverages (eg, soft drinks) high in sugar and fat, especially saturated and trans fats.
- Plant a garden.

## ***How can our family eat healthy meals together when we are so busy?***

- Make food preparation and cooking an enjoyable family activity.
- Eat different meals together. For example, eat breakfast together one day and lunch or dinner the next.
- Make simple meals (eg, salads, soups, sandwiches).
- Buy healthy, ready-to-eat foods from the store or healthy take-out foods from a restaurant.
- When your family eats together, use the time to socialize. Avoid distractions. Turn the television off, and don't answer the telephone.
- Try to prioritize family meals, and strive to eat 4 meals (breakfast, lunch, or dinner) together a week.

## ***How can I get my child to eat breakfast?***

- Provide foods that are fast and convenient (eg, bagels, low-fat granola bars, fruit, 100% fruit juice [limit to 6–8 oz per day], yogurt).
- Serve foods other than the usual breakfast foods (eg, sandwiches, baked potatoes, leftovers such as chicken or pasta).
- Help your child get organized so that she has time to eat in the morning.
- Make breakfast the night before.
- If your child is in a hurry, offer her foods such as fruit or trail mix to eat at school.
- See if your school offers a breakfast program.

## ***How can I get my child to eat more fruits and vegetables?***

- Keep a variety of fruits and vegetables at home.
- Put cut-up fruits and vegetables on the counter when you know your teenager will be hungry.
- Wash and cut up fruits and vegetables, and keep them in the refrigerator along with low-fat dip or salsa. Use a clear container so that the fruits and vegetables can be seen easily.
- Serve 2 or more vegetables with dinner, including at least one your child likes. Serve a salad with a choice of low-fat dressing.
- Use plenty of vegetables in soups, sauces, and casseroles.
- Pack fruits and vegetables in your child's bag to eat at school.
- Offer a variety of fruits and vegetables at meals and snacks, but don't force your child to eat them.
- Plant a garden.
- Be a good role model—eat more fruits and vegetables yourself.

### **How can I help my child get enough calcium?**

- Serve foods that are rich in calcium, such as low-fat (1%) or fat-free (skim) milk products (eg, milk, cheese, cottage cheese, yogurt), tofu processed with calcium sulfate, broccoli, and collard and turnip greens.
- Use low-fat or fat-free milk products in recipes (eg, in puddings, milkshakes, soups, casseroles).
- If your child's digestive system cannot handle milk and milk products (ie, he is lactose intolerant), try these suggestions.
  - Serve small portions of these foods throughout the day.
  - Serve these foods along with non-milk products.
  - Serve lactose-free milk products, including milk and yogurt, and aged hard cheeses (eg, cheddar, Colby, Swiss, Parmesan) that are low in lactose. Add lactose drops to your child's milk.
  - Give your child lactase tablets before she eats milk products containing lactose.
  - Serve foods, such as 100% juice (limit to 6–8 oz per day) and cereal products, with added calcium (calcium-fortified).
- If these ideas do not work, ask a health professional about giving your child a calcium supplement.

### **My child has become a vegetarian. Should I be concerned?**

- With careful planning, a vegetarian diet can be healthy and can meet children's nutritional needs.
- A vegetarian diet that includes milk products and eggs usually provides adequate nutrients; however, your child may need to take an iron supplement.
- Vegans are strict vegetarians who don't eat any animal products, including dairy foods, eggs, or fish. They may need additional calcium, vitamin B<sub>12</sub>, and vitamin D, which can be provided by fortified foods and supplements.
- Instead of always preparing separate vegetarian meals for your child, occasionally fix vegetarian meals for the whole family.
- Ask a registered dietitian or nutritionist to help you plan healthy meals.

### **How can I teach my child to make healthy food choices away from home?**

- Encourage your child to make healthy food choices when purchasing food at school, stores, and restaurants, and from vending machines.
- Review school and restaurant menus with your child, and discuss healthy food choices and appropriate portions. Find foods that are low in fat, sugar, and calories.
- Encourage your child to eat salads with low-calorie dressing, fruits, vegetables, and broiled or baked meats.
- Encourage your child to avoid eating fried foods or to reduce the serving size (eg, by splitting an order of french fries with a friend).
- Teach your child to ask for changes to make foods healthier, such as asking the server to “hold the mayonnaise.”

### **My child snacks on chips and candy. What should I do?**

- Limit foods in your home that are high in fat, such as potato chips that are fried, and high in sugar, such as candy and sweetened beverages (eg, fruit drinks, soft drinks).
- Keep a variety of easy-to-prepare and healthy foods on hand.
- Serve healthier foods (eg, whole-grain low-fat products, 100% fruit juice [limit to 6–8 oz per day], fruit, applesauce, vegetables, yogurt).
- Wash and cut up vegetables, and keep them in a clear container (so they can be seen easily) in the refrigerator, along with low-fat dip or salsa. Keep them at your child's eye level so they are the first thing the child sees when he opens the fridge.
- Keep a bowl of fruit on the table or counter.
- Encourage your child to make healthy food choices when purchasing food at school, stores, and restaurants, and from vending machines.

### ***How can I help my child be more active?***

- Encourage spur-of-the-moment physical activity (eg, dancing to music).
- Limit your child's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day. Don't put a television in your child's bedroom; if one is already there, remove it.
- For every hour your child reads, watches television, or plays computer or video games, encourage her to take a 10-minute physical activity break.
- Involve your child in family chores (eg, raking leaves, walking the dog).
- Make physical activity a part of your child's daily life. For example, use the stairs instead of taking an elevator or escalator, and walk or ride a bike instead of riding in a car.
- Enroll your child in planned physical activities (eg, swimming, martial arts, dancing).
- Be physically active together, (eg, biking, playing ball, dancing, skating). It's a great way to spend time with your child.
- Take turns selecting physical activities that family members and friends can do together.
- Plan at least one special physical activity (eg, a hike, a bike ride) each week.
- Be a good role model—engage in regular physical activity yourself.

### ***What should I do if my child is overweight?***

- If you are concerned about your child's weight, bring this to the attention of your child's health professional, and request an evaluation of your child's BMI.
- Never place your child on a diet to lose weight, unless a health professional recommends one for medical reasons and supervises it.
- Focus on gradually changing the entire family's eating and physical activity behaviors.
- Serve healthy meals and snacks at scheduled times, but allow for flexibility.
- Limit foods that are high in fat, such as fried potato chips, and foods that are high in sugar, such as candy and sweetened beverages (eg, fruit drinks, soft drinks).
- Limit most beverages to low-fat or fat-free milk, water, and 100% fruit juice (limited to 6 oz per day).

- Serve low-fat or fat-free milk products.
- Do not forbid sweets and desserts. Serve them in moderation.
- Look at school menus with your child, and discuss healthy food choices and appropriate portions.
- Plan family activities that everyone enjoys (eg, hiking, biking, swimming).
- Limit to 1 to 2 hours per day the amount of time your child watches television and plays computer or video games.
- Be a good role model—practice healthy eating behaviors and engage in regular physical activity yourself. Children need at least 60 minutes of moderate to vigorous activity each day.
- Work with your community to make sure that your child has safe places for being physically active (eg, walking and biking paths, playgrounds, parks).
- Do not make negative comments about their weight or allow teasing about weight by other family members.

### ***How can I help my underweight child gain weight?***

- Limit the quantity of beverages your child drinks between meals if his appetite is being affected.
- Serve an after-school snack, and encourage your child to eat a midmorning snack at school, if possible. Limit snacks close to mealtimes if snacking is affecting his appetite.
- Involve your child in meal planning and food preparation.
- Continue to offer foods even if your child has refused to eat them before. Your child is more likely to accept these foods after they have been offered several times.

### ***How can I help my child like her body?***

- Children are sensitive about how they look. Do not criticize your child about his size or shape.
- Focus on traits other than appearance when talking to your child.
- Talk to your child about how the media affects his body image.
- Be a good role model—don't criticize your own size or shape or that of others.

**If you notice any of these symptoms, talk to a health professional about your concerns.**

#### **ANOREXIA NERVOSA**

- Excessive weight loss in a short period
- Continuation of dieting although thin
- Dissatisfaction with appearance; belief that body is fat even though extremely thin
- Unusual interest in certain foods, and development of unusual eating rituals
- Eating in secret
- Obsession with exercise
- Depression

#### **BULIMIA NERVOSA**

- Unusual interest in certain foods and development of unusual eating rituals
- Eating in secret
- Obsession with exercise
- Depression
- Binge-eating
- Binge-eating with no noticeable weight gain
- Vomiting or laxative use
- Disappearance into bathroom for long periods (eg, to induce vomiting)

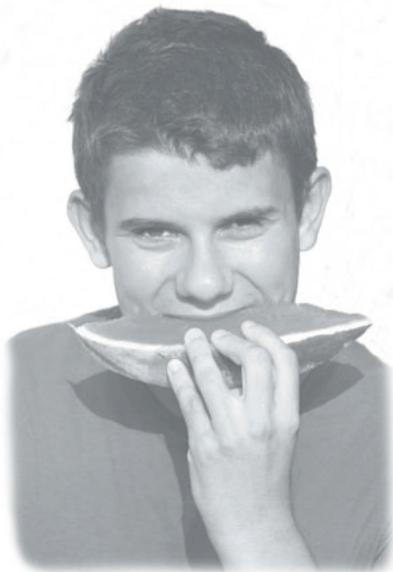
#### **RESOURCES FOR FAMILIES**

- Centers for Disease Control and Prevention. Division of Nutrition, Physical Activity and Obesity. <http://www.cdc.gov/nccdphp/dnpa>
- Centers for Disease Control and Prevention. *Eat a Variety of Fruits & Vegetables Every Day*. <http://www.fruitsandveggiesmatter.gov>
- International Food Information Council. *Kidnetic*. <http://www.kidnetic.com>
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- US Department of Agriculture, Food and Nutrition Service. *Eat Smart. Play Hard*. <http://teamnutrition.usda.gov/Resources/eatsmartmaterials.html>
- US Department of Agriculture, Food and Nutrition Service. *Empowering Youth with Nutrition and Physical Activity*. <http://healthymeals.nal.usda.gov/hsmrs/EY>
- US Department of Agriculture, Food and Nutrition Service. *Loving Your Family, Feeding Their Future*. [http://snap.nal.usda.gov/nal\\_display/index.php?info\\_center=15&tax\\_level=3&tax\\_subject=261&topic\\_id=1941&level3\\_id=6322&level4\\_id=0](http://snap.nal.usda.gov/nal_display/index.php?info_center=15&tax_level=3&tax_subject=261&topic_id=1941&level3_id=6322&level4_id=0)
- US Department of Agriculture, Food and Nutrition Service. *Team Nutrition*. <http://www.fns.usda.gov/tn>





# Adolescence







# Adolescence

## CONTEXT

Adolescence (ages 11–21), the transition between childhood and adulthood, is one of the most dynamic periods of human development. Adolescence is characterized by dramatic physical, cognitive, social, and emotional changes. These changes, along with adolescents' growing independence, search for identity, concern with appearance, need for peer acceptance, and active lifestyles, can significantly affect their eating behaviors, weight, and nutrition status.

Rapid physical growth creates an increased demand for energy and nutrients. Practicing healthy eating behaviors during adolescence is essential for

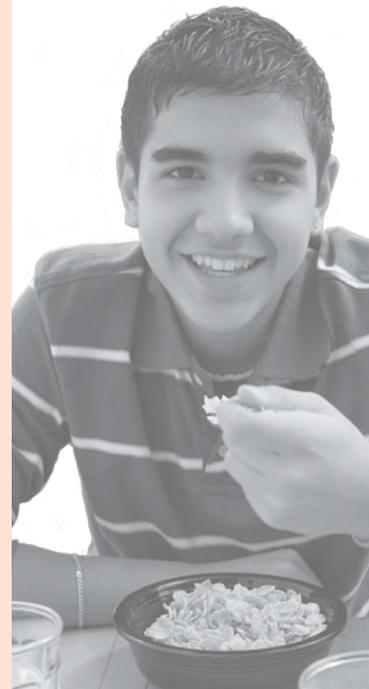
- Promoting optimal growth, development, weight, and health
- Preventing immediate health problems (eg, iron-deficiency anemia, undernutrition, obesity, eating disorders, dental caries [tooth decay])
- Laying the foundation for lifelong health and reducing the risk for chronic diseases (eg, cardiovascular disease, type 2 diabetes mellitus, hypertension, some forms of cancer, osteoporosis)

Adolescence is divided into 3 stages. Early adolescence, ages 11 to 14, includes pubertal and cognitive changes. Middle adolescence, ages 15 to 17, is a time of increased independence and experimentation. During late adolescence, ages 18 to 21, adolescents make important personal and vocational decisions. These stages provide a useful context for understanding adolescents' eating behaviors and body image issues. The stages can also serve as a framework for providing adolescents with the information they need to practice healthy eating behaviors and be physically active.

## GROWTH AND PHYSICAL DEVELOPMENT

The phenomenal growth that occurs during adolescence is second only to the growth that occurs during the first year of life and increases the body's demand for energy and nutrients. Total nutrition needs are greater during adolescence than at any other time in the life cycle. During this period, adolescents achieve the final 15% to 20% of their adult height, gain about 50% of their adult body weight, and accumulate up to 40% of their adult skeletal mass.<sup>1</sup> Nutrient needs parallel the rate of growth, with the greatest demands occurring during the peak period of growth (sexual maturity rating [SMR] 2–3 in females and 3–4 in males). For females, most physical growth is completed by about 2 years after menarche. (The mean age of menarche is age 12.5.) Males begin puberty about 2 years later than females, and they typically experience their major growth spurt and increase in muscle mass during middle adolescence.

Nutrition and physical activity are major determinants of adolescents' energy requirements and influence growth and body composition. Inadequate nutrition can delay sexual maturation, slow or stop linear growth, and compromise peak bone mass. Practicing



healthy eating behaviors and engaging in regular physical activity can help adolescents achieve normal body weight and body composition, thereby reducing their risk for obesity.

The changes associated with puberty can affect adolescents' satisfaction with their appearance. For males, the increased size and muscle development that come with physical maturation usually improve their body image. However, physical maturation among females may lead to dissatisfaction with their bodies, which may result in weight concerns and dieting.

Anticipatory guidance can help prepare adolescents and their parents for changes associated with puberty and help adolescents develop a positive body image. Because adolescents are interested in their own growth and development, this period presents health professionals with a key opportunity to discuss the importance of healthy eating behaviors, regular physical activity, and a positive body image.

Undernutrition compromises cognitive development, which affects learning, concentration, and school performance. Conversely, eating breakfast may improve cognitive function related to memory, test grades, and school attendance.<sup>2</sup>

### DEVELOPMENT ISSUES

Cognitive capacities increase dramatically during adolescence. During early adolescence, adolescents have a growing capacity for abstract thought, but their thinking still tends to be concrete and oriented toward the present. During middle adolescence, they become more capable of problem-solving and abstract and future-oriented thinking. During late adolescence, they continue to refine their ability to reason logically and solve problems. The cognitive changes that occur during adolescence can facilitate healthy eating and regular physical activity, because adolescents are beginning to reflect on their behavior and understand its consequences.

Developing an identity and becoming an independent young adult are central to adolescence. Because foods can have symbolic meanings, adolescents may use them to establish individuality and express their identities.

Experimentation and idealism are common during middle adolescence. Adolescents may try fad diets and underestimate the associated health risks. Adolescents may adopt certain eating behaviors (eg, vegetarianism) to explore various lifestyles or to show concern for the environment. Adolescents are usually interested in new foods, including those from different cultures and ethnic groups. This can be a time to try new foods and learn cooking skills.

The social pressure to be thin and the stigma of obesity can lead to unhealthy eating behaviors and a poor body image. (See Tool I: Tips for Fostering a Positive Body Image Among Children and Adolescents.)

Adolescents spend a lot of time with their friends, and peer influence and group conformity are important. They may eat certain foods as a form of group identification. As adolescents strive for independence, they begin to spend more time away from home and thus eat more meals and snacks away from home. Although parents cannot control what their adolescents eat when they are away from home, they can make sure that healthy foods, such as fruits and vegetables, are available at home and limit the availability of high-calorie, low-nutrient foods, such as sweetened beverages and salty snacks.

Many adolescents go to stores and fast-food restaurants on their own and purchase foods with their own money. Snacks and fast foods can be high in calories, fat, and sugar, and their consumption should be limited. Parents can be positive role models by practicing healthy eating behaviors themselves. In addition, parents and health professionals can provide guidance to help adolescents make healthy food choices away from home.

### HEALTHY LIFESTYLES

Adolescents can achieve substantial health benefits by doing physical activity for a total of 60 minutes or more each day. This should include aerobic activity as well as age-appropriate aerobic, muscle-strengthening, and bone-strengthening activities. It appears that the total amount of physical activity is more important for achieving health benefits than any one component

(frequency, intensity, or duration) or the specific mix of activities (aerobic, muscle-strengthening, or bone strengthening). Bone-strengthening activities remain especially important for adolescents because the greatest gains in bone mass occur during the years just before and during puberty. In addition, most peak bone mass is obtained by the end of adolescence.<sup>3</sup>

Adolescents who are physically active

- Have higher levels of cardiorespiratory fitness and stronger muscles
- Typically have less body fat
- Have stronger bones
- May have reduced symptoms of anxiety and depression

As adolescents grow and develop, their motor skills increase, giving them more opportunities for engaging in physical activity. By being physically active (eg, biking, hiking, playing baseball) with their adolescent, parents emphasize the importance of regular physical activity. When parents encourage adolescents to be physically active, adolescents' physical activity levels significantly increase.<sup>4</sup>

Because much of their physical activity occurs in group settings, adolescents' engagement in physical activity may be influenced by peers. Physical education at school should be provided every day, and a variety of enjoyable activities should be offered.

### BUILDING PARTNERSHIPS

Healthy eating behaviors and regular physical activity promote adolescents' nutrition and weight status. Partnerships among health professionals, families, and communities are integral to developing nutrition and physical activity programs.

Schools can play a significant role in promoting healthy eating behaviors among adolescents. Nutrition education should be integrated

within a comprehensive school health education program for adolescents. Schools can reinforce what is taught in the classroom by providing healthy foods. Foods sold at school (eg, in vending machines, at sports events, for fundraising) should be healthy. Federally funded school meal programs help provide adolescents with a substantial part of their daily nutrition requirements. (See Tool K: Federal Nutrition Assistance Programs.) Food shelves and pantries, community groups, and faith-based organizations can also provide food.

### COMMON NUTRITION CONCERNS

Common nutrition concerns during adolescence include the following:

- Decrease in consumption of milk and other milk products
- Increase in consumption of sweetened beverages, especially soft drinks and sports drinks
- Insufficient intake of fruits and vegetables
- Higher consumption than recommended of foods high in fat, especially saturated and trans fats, cholesterol, and sodium
- Rise in overweight and obesity
- Low levels of physical activity
- Increase in eating disorders, body image concerns, dieting, and unsafe weight-loss methods
- Prevalence of iron-deficiency anemia (in females)
- Prevalence of hyperlipidemia
- Food insecurity among adolescents from families with low incomes

For a list of risk factors that can lead to poor nutrition status, see Tool D: Key Indicators of Nutrition Risk for Children and Adolescents. If there is evidence that an adolescent is at risk for poor nutrition, further assessment is needed, including a nutritional assessment, laboratory tests, or both.

# Nutrition Supervision

An adolescent's nutrition and weight status should be evaluated during nutrition supervision visits or as part of health supervision visits. (For more information on health supervision, see *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, Third Edition, listed under Suggested Reading in this chapter.) It is important to remember that nutrition supervision, which includes asking interview questions, conducting screening and assessment, and providing anticipatory guidance, should be used as appropriate and will vary from visit to visit and from adolescent to adolescent.

Health professionals begin nutrition supervision by selectively asking interview questions about the adolescent's nutrition status, to invite discussion and build partnerships. Use of the questions may vary from visit to visit and from family to family. Questions can be modified to match the health professional's communication style. Gathering information can also be accomplished by reviewing a questionnaire filled out by parents and/or the adolescent before the visit. (See Tool C: Nutrition Questionnaire for Adolescents Ages 11 to 21.) Additionally, to meet the challenge of providing nutrition supervision to diverse populations, health professionals need to appreciate the variety of cultural traditions related to food and the wide variation in food practices within and among cultural groups. (See the Cultural Awareness in Nutrition Services chapter.) Asking interview questions provides a useful starting point for identifying an adolescent's nutrition concerns.

## Interview Questions

### *Eating Behaviors and Food Choices*

#### FOR THE ADOLESCENT

- Which meals do you usually eat each day? How many snacks? How many times a week do you eat breakfast? Lunch? Dinner?
- How often does your family eat meals together?
- What do you usually eat and drink in the morning? Around noon? In the afternoon? In the evening? Between meals?
- What snacks do you usually eat?

- Are there any foods you won't eat? If there are, which ones?
- How often do you drink milk? What kind of milk do you drink (eg, whole milk, reduced fat [2%], low-fat milk [1%], fat-free [skim milk])? What other milk products do you like to eat?
- What fruits and vegetables, including juices, did you eat or drink yesterday?
- How often do you drink soft drinks, energy drinks, or sports drinks?
- What changes would you like to make in the way you eat?

#### FOR THE PARENT

- How often does your family eat meals together?
- Do you have any concerns about your teenager's eating behaviors?
- Do you think your teenager eats healthy foods? Why or why not?

### *Food Resources*

#### FOR THE ADOLESCENT OR PARENT

- Who usually buys the food for your family? Who prepares it?
- Are there times when there is not enough food to eat or not enough money to buy food?

### *Weight and Body Image*

#### FOR THE ADOLESCENT

- How do you feel about the way you look?
- Do you think that you weigh too little? Weigh too much? Are just the right weight? Why?
- How do you feel about your weight and height?
- Are you trying to change your weight? If so, how?
- How much would you like to weigh?
- Are you teased about your weight?

#### FOR THE PARENT

- How do you feel about your teenager's weight and height?

## Physical Activity

### FOR THE ADOLESCENT

- What do you do to be physically active? How often?
- How much time do you spend being active in a week?
- What physical activity would you like to do that you are not doing now? How can you make time for it?
- How much time do you spend each day watching television and playing computer or video games?
- What do you think you can do to be more active?

### FOR THE PARENT

- What type of physical activity does your teenager engage in? How often?
- How much time does your teenager spend each day watching television or playing computer or video games?
- Does your teenager have a television in his bedroom?

## Screening and Assessment

### Growth and Physical Development

- Measure the adolescent's height and weight, and plot these on a standard growth chart. Deviation from the expected growth pattern (eg, a major change in growth percentiles on the chart) should be evaluated. This may be normal or may indicate a nutrition problem (eg, difficulties with eating).
- Height and weight measurements can be used to indicate nutrition and growth status. Changes in weight reflect an adolescent's short-term nutrient intake and serve as general indicators of nutrition status and overall health. Low height-for-age may reflect long-term, cumulative nutrition or health problems.

- Body mass index (BMI) is used as a screening tool to determine nutrition status and overall health. Calculate the adolescent's BMI by dividing weight by the square of height ( $\text{kg}/\text{m}^2$ ) or using a BMI wheel or calculator. To interpret BMI, plot the adolescent's BMI and age on a BMI-for-age growth chart to determine the adolescent's BMI percentile.
- Some adolescents have a high BMI because of a large, lean body mass resulting from physical activity, muscularity, or frame size. An elevated skinfold (ie, above the 95th percentile on Centers for Disease Control and Prevention [CDC] growth charts) can confirm excess body fat in adolescents.
- Evaluate the appearance of the adolescent's skin, hair, teeth, gums, tongue, and eyes.
- Obtain the adolescent's blood pressure. (See the Hypertension chapter.)
- Assess the adolescent's risk for familial hyperlipidemia. (See the Hyperlipidemia chapter.)

Table 1 provides an overview of indicators of height and weight status. When an adolescent is outside the healthy weight range, a more in-depth assessment may be needed. Body mass index serves only as a screening tool and should not be used as a diagnostic tool.

### Stunting

- Adolescents whose height-for-age is below the third percentile should be evaluated. Stunting reflects a failure to reach optimum height as a result of poor nutrition or poor health.<sup>5</sup> However, most adolescents with low height-for-age are short as a result of genetics, not because their growth is stunted. Stunting has been reported in adolescents with severely inadequate energy intake or chronic illnesses. The goal is to identify adolescents whose growth is stunted and who may benefit from improved nutrition or treatment of other

**TABLE 1. INDICATORS OF HEIGHT AND WEIGHT STATUS**

Indicator	Anthropometric Variable	Cut-Off Values
Stunting	Height-for-age	<3rd percentile
Underweight	BMI-for-age	<5th percentile
Healthy weight	BMI-for-age	≥5th–84th percentiles
Overweight	BMI-for-age	≥85th–94th percentiles
Obesity	BMI-for-age	≥95th percentile

Sources: World Health Organization,<sup>5</sup> Barlow et al,<sup>6</sup> and Krebs et al.<sup>7</sup>

underlying problems. Adolescents with special health care needs may have low height-for-age because of a genetic disorder, chronic eating problems, an altered metabolic rate, malabsorption syndrome, or other conditions. All of these factors should be assessed, and interventions should be implemented to help adolescents reach the height that they have the potential to achieve. A referral to an endocrinologist may be necessary to rule out growth hormone or thyroid deficiency.

### ***Underweight***

- Adolescents with a BMI below the fifth percentile should be assessed for organic disease and eating disorders. Adolescents may be thin naturally, or they may be thin as a result of inadequate energy intake, inadequate food resources, restrictive dieting, a nutritional deficit, or a chronic disease.

### ***Overweight***

- Adolescents with a BMI between the 85th and 94th percentiles are considered overweight and need further screening.<sup>6</sup> (See the Obesity chapter.)

### ***Obesity***

- Adolescents with a BMI at or above the 95th percentile are considered obese and need an in-depth medical assessment.<sup>7</sup> Adolescents with a BMI above the 99th percentile are at highest risk for comorbidities associated with excessive weight. However, there is no consensus on a definition of severe obesity in adolescents. The expert committee suggested using the 99th percentile based on cutpoints from National Health and Nutrition Examination Survey data.<sup>8</sup> These cutpoints may be imprecise, but adolescents with a BMI at or above this level are at higher risk for comorbidities compared with adolescents with BMIs in the normal range, and therefore intervention is urgent. (See the Obesity chapter.)

### ***Iron-Deficiency Anemia***

- Recommendations for iron-deficiency anemia screening have been put forth by the American Academy of Pediatrics (AAP) and CDC. (See the Iron-Deficiency Anemia chapter.)

### **FOR ADOLESCENT FEMALES AGES 12 TO 21**

- The AAP recommends screening adolescent females during all routine physical examinations.<sup>9</sup>
- The CDC recommends annually screening adolescent females with known risk factors for iron-deficiency anemia (eg, extensive menstrual or other blood loss, low iron intake, a previous diagnosis of iron-deficiency anemia). For those with no known risk factors, the CDC recommends screening every 5 to 10 years during routine physical examinations.<sup>10</sup>

### **FOR ADOLESCENT MALES AGES 12 TO 18**

- The AAP recommends screening adolescent males during their peak growth period during routine physical examination.<sup>9</sup>
- The CDC recommends screening adolescent males with known risk factors for iron-deficiency anemia (eg, low iron intake, special health care needs, previous diagnosis of iron-deficiency anemia).<sup>10</sup>

### ***Oral Health***

- Ask whether the adolescent has regular dental visits.
- Assess eating behaviors (eg, frequency of consuming foods and beverages high in sugar) to determine the adolescent's risk for dental caries (tooth decay). (See the Oral Health chapter.)

### ***Physical Activity***

- Assess the adolescent's level of physical fitness by
  - Asking how much physical activity the adolescent engages in on a weekly basis
  - Evaluating how the adolescent's physical fitness compares with national standards (eg, how well the adolescent did on the school's standardized physical fitness assessment)
- For physical activity characteristics associated with an increased likelihood of poor nutrition, see Tool D: Key Indicators of Nutrition Risk for Children and Adolescents. If there is evidence of nutrition risk, further assessment is needed, including a nutritional assessment and/or laboratory tests.
- Screen for the amount of time the adolescent spends watching television and on other media activities, such as computer or video games. Ask whether the adolescent watches television during mealtimes.

## Anticipatory Guidance

Anticipatory guidance should address the adolescent's and parents' nutrition concerns. In addition, health professionals should offer information on the adolescent's nutrition status; make the adolescent and parents aware of what to expect as the adolescent enters the next developmental period; and promote a positive attitude about eating behaviors, food choices, and physical activity. (For additional information, see Tool F: Stages of Change—A Model for Nutrition Counseling, and Tool G: Strategies for Health Professionals to Promote Healthy Eating Behaviors.)

### Growth and Physical Development

- Explain the standard growth chart to adolescents and their parents, and show them how they compare to other adolescents their age. Discuss upcoming physical changes and specific concerns. Emphasize that a healthy body weight is based on a genetically determined size and shape rather than on an ideal, socially defined weight. A healthy body weight can be achieved by practicing healthy eating behaviors, limiting intake of beverages high in sugar (eg, soft drinks), and being physically active. Explain the importance of energy balance and watching portion sizes. (See Tool I: Tips for Fostering a Positive Body Image Among Children and Adolescents.)
- Help adolescents understand and accept normal physical changes (eg, weight changes; the widening of females' hips and fat accumulation in their bodies; the large variation in height, weight, and growth rates among adolescents).

#### FOR EARLY ADOLESCENCE: AGES 11 TO 14

- Discuss that adolescent females' physical growth and development may lead to dissatisfaction with their appearance. Reassure them that fat accumulation in the hips, thighs, and buttocks is normal during adolescence (from 15%–18% of body weight before puberty to 20%–25% at the end of puberty).<sup>1</sup>

- Discuss that adolescent males may experience a slight weight gain before their growth spurt (ie, increase in height), which occurs between ages 9 and 13. In addition, their body fat percentage decreases during their growth spurt (SMR 3–4). After puberty, their body fat percentage increases, and by age 18, it is about 15% to 18% of their body weight. Reassure adolescent males and their parents that fat gain is normal and will probably level off during the upcoming growth spurt.<sup>1</sup>

#### FOR MIDDLE ADOLESCENCE: AGES 15 TO 17

- Reassure late-maturing adolescent males that they are normal. Use charts that plot height velocity by age and SMR to ease their concerns.

#### FOR LATE ADOLESCENCE: AGES 18 TO 21

- Explain the standard growth chart to adolescents, and show them how they compare to other adolescents their age. Discuss any specific concerns.

### Eating Behaviors and Food Choices

- Discuss healthy eating behaviors, ways to achieve them, and the importance of not skipping meals. Encourage healthy food choices based on the *Dietary Guidelines for Americans*<sup>11</sup> and *MyPyramid*.<sup>12</sup> (See the Healthy Eating and Physical Activity chapter.)
- Explain that energy (calorie) requirements increase greatly during adolescence and are influenced by growth status, physical activity level, and body composition (Table 2).
- Encourage adolescents to drink 3 cups of low-fat (1%) or fat-free (skim) milk or consume the equivalent from other milk products (eg, yogurt, cheese) per day to meet their calcium needs, because bone density increases well into young adulthood (the 20s). Eating foods that provide enough calcium, such as milk, yogurt, and cheese, to attain maximum bone density helps prevent osteoporosis and bone fractures later in life.
- Tell parents that to prevent rickets and vitamin D deficiency, adolescents who do not obtain 400 IU/day of vitamin D through vitamin D–fortified milk (100 IU per 8-oz serving) and vitamin D–fortified foods (eg, fortified cereals, eggs [yolk]) should receive a vitamin D supplement of 400 IU/day.<sup>13</sup>

**TABLE 2. ESTIMATED CALORIE REQUIREMENTS (IN KILOCALORIES) FOR EACH GENDER AND AGE GROUP AT 3 LEVELS OF PHYSICAL ACTIVITY<sup>11</sup>**

Gender	Age (years)	Sedentary <sup>a</sup>	Moderately Active <sup>b</sup>	Active <sup>c</sup>
Female	9–13	1,600	1,600–2,000	1,800–2,200
	14–18	1,800	2,000	2,400
	19–30	2,000	2,000–2,200	2,400
Male	9–13	1,800	1,800–2,200	2,000–2,600
	14–18	2,200	2,400–2,800	2,800–3,200
	19–30	2,400	2,600–2,800	3,000

<sup>a</sup>Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life.

<sup>b</sup>Moderately active means a lifestyle that includes physical activity equivalent to walking about 1.5 to 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.

<sup>c</sup>Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.

- Explain to parents that the quality of the diet often decreases from childhood through adolescence because adolescents are more independent and make their own food choices. Encourage parents to provide a variety of healthy foods at home; limit the availability of high-calorie, low-nutrient foods; and make family mealtimes a priority. Eating family meals together provides parents an opportunity to model healthy eating behaviors and to promote communication.
- Encourage adolescents to limit foods high in fat, especially those high in saturated and trans fats (eg, chips, french fries) and foods (eg, candy, cookies) and beverages (eg, fruit drinks, soft drinks) high in sugar.
- Encourage adolescents to choose healthy foods at home and when eating away from home.
- Many adolescent females begin to diet after the onset of puberty. Early-maturing females are more likely to diet shortly after puberty than those who mature later. Overweight adolescent females are also more likely to diet and use unhealthy weight-loss practices. Discuss safe and healthy ways to achieve and maintain a healthy body weight.

#### **Oral Health**

- Encourage the adolescent to drink water when thirsty and to limit intake of beverages high in sugar (eg, juice, juice drinks, soft drinks).
- Encourage the adolescent to brush his or her teeth with fluoridated toothpaste twice a day (after breakfast and before bed).

- Tell adolescents that limiting their consumption of foods (eg, candy, cookies) and beverages (eg, juice, juice drinks, soft drinks) high in sugar can help prevent dental caries (tooth decay).
- Explain that drinking fluoridated water is a safe and effective way to significantly reduce the risk for tooth decay in adolescents. (See the Oral Health Chapter.) For families that prefer bottled water, a brand in which fluoride is added at a concentration of approximately 0.8 to 1.0 mg/L (ppm) is recommended.<sup>14</sup>

#### **Weight and Body Image**

- Emphasize that a healthy body weight is based on a genetically determined size and shape rather than on an ideal, socially defined weight.
- A healthy body weight can be achieved by practicing healthy eating behaviors, limiting intake of beverages high in sugar (eg, fruit drinks, soft drinks), and being physically active. Explain the importance of energy balance and watching portion sizes.
- Discuss healthy and safe ways for adolescents to achieve and maintain a healthy weight (eg, by practicing healthy eating behaviors; limiting high-calorie, low-nutrient foods and beverages; engaging in regular physical activity; reducing sedentary behaviors).<sup>15</sup> Discourage dieting; instead, emphasize a healthy lifestyle.
- Help the adolescent build a positive body image by explaining that people come in unique sizes and shapes, within a range of healthy body weights. Adolescents need to know that they are loved and accepted as they are, regardless of their size and shape. (See Tool I: Tips for Fostering a Positive Body Image Among Children and Adolescents.)

### ***Physical Activity***

- Encourage the adolescent to engage in 60 or more minutes of daily physical activity. Explain to the adolescent the following guidelines:<sup>3</sup>
  - Aerobic: Most of the 60 or more minutes a day should be either moderate-intensity (eg, hiking, skateboarding) or vigorous-intensity (eg, running, bicycling) aerobic physical activity and should include vigorous-intensity physical activity at least 3 days a week.
  - Muscle-strengthening: As part of the 60 or more minutes of daily physical activity, adolescents should include muscle-strengthening physical activity (eg, climbing trees, sit-ups) at least 3 days a week.
  - Bone-strengthening (weight-bearing): As part of their 60 or more minutes of daily physical activity, adolescents should include bone-strengthening physical activity (eg, jumping rope, playing basketball) at least 3 days a week.
- Encourage adolescents with special health care needs to engage in regular physical activity for cardiovascular fitness (within the limits of the adolescent's medical or physical conditions). Explain that adaptive physical education is often helpful and that a physical therapist can help identify appropriate activities. (See the Children and Adolescents With Special Health Care Needs chapter.)
- Emphasize the importance of wearing safety equipment (eg, helmets, pads, mouth guards, goggles) when the adolescent is physically active.
- If the safety of the environment or neighborhood is a concern, help adolescents find other settings for physical activity.
- Engagement in physical activity declines dramatically during early adolescence, especially in females. Help adolescents incorporate regular physical activity into their daily lives (eg, through physical education at school and activities with family and friends).
- Encourage adolescents to drink plenty of water when they are physically active.
- Explain to parents about the effects of television and media viewing. Encourage them to turn off the television during mealtimes and not to have a television in the adolescent's bedroom. Tell parents to limit the adolescent's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day.<sup>16</sup>
- Encourage adolescents, especially those who are overweight, to reduce sedentary behaviors (eg, watching television, playing computer or video games).

### ***Substance Use***

- Discourage adolescents from consuming excessive quantities of caffeinated beverages (eg, soft drinks, coffee, energy drinks).
- Warn adolescents about the dangers of using alcohol, tobacco, and other drugs.
- Warn adolescents about the dangers of using performance-enhancing products (eg, protein supplements, anabolic steroids).

The desired outcomes for the adolescent and the role of the family outlined in Table 3 can assist health professionals in promoting optimal nutrition.

**TABLE 3. DESIRED OUTCOMES FOR THE ADOLESCENT, AND THE ROLE OF THE FAMILY**

	<b>Educational/Attitudinal</b>	<b>Behavioral</b>	<b>Health</b>
<b><i>Desired Outcomes for the Adolescent</i></b>	<p>Understands that healthy eating behaviors and regular physical activity are crucial to growth, development, weight, and health</p> <p>Understands the importance of eating a variety of healthy foods and appropriate serving sizes</p> <p>Understands the importance of family meals</p> <p>Understands the physical, emotional, and social benefits of regular physical activity and how to increase physical activity level</p> <p>Understands that people come in unique body sizes and shapes, within a range of healthy body weights</p> <p>Understands safe ways to achieve and maintain a healthy body weight, and recognizes the dangers of unsafe weight-loss and weight-gain methods</p>	<p>Consumes a variety of healthy foods</p> <p>Limits intake of high-calorie, low-nutrient foods and beverages</p> <p>Makes healthy food choices at and away from home</p> <p>Seldom skips meals, and does not practice restrictive or disordered eating behaviors</p> <p>Engages in physical activity on most, if not all, days of the week</p> <p>Watches television or plays computer or video games no more than 1 to 2 hours of quality programming a day</p> <p>Does not have a television in his bedroom</p>	<p>Maintains optimal nutrition to promote growth and development</p> <p>Achieves nutritional and physical well-being, without signs of iron-deficiency anemia, undernutrition, obesity, eating disorders, dental caries, or other nutrition-related problems</p> <p>Achieves and maintains a healthy body weight and positive body image</p>
<b><i>Role of the Family</i></b>	<p>Understands the nutrition needs of the growing adolescent</p> <p>Understands physical changes that occur with growth and development</p> <p>Understands the relationship between nutrition and short- and long-term health</p> <p>Understands the importance of a healthy diet consisting of 3 meals per day and snacks as needed</p> <p>Understands that people come in unique body sizes and shapes, within a range of healthy body weights</p> <p>Understands the dangers of unsafe weight-loss methods, and knows safe ways to achieve and maintain a healthy weight</p>	<p>Provides a positive role model: practices healthy eating behaviors, engages in regular physical activity, and promotes a positive body image</p> <p>Provides a variety of healthy foods at home, limiting the availability of high-fat and high-sugar foods</p> <p>Eats meals together regularly to ensure optimal nutrition and to facilitate family communication</p> <p>Provides opportunities for the adolescent to participate in meal planning and food preparation</p> <p>Uses community nutrition programs and food resources if needed</p> <p>Engages in regular physical activity with the adolescent</p>	<p>Provides developmentally appropriate, healthy foods, and modifies them if necessary</p> <p>Helps the adolescent achieve and maintain a healthy weight</p> <p>Provides opportunities and safe places for the adolescent to be physically active</p>

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# A Dancer's Dream

Middle-schooler Katherine Gomez loves to dance and has been taking lessons since she was 5. Katherine has dreamed of being on her school's dance team, and now, as a seventh-grader, she can try out for the team. Katherine's mother is concerned that Katherine appears "chunky" and thinks that she will probably need to slim down if she is going to have a chance of making the team. Mrs Gomez asks their physician, Dr Meyer, for a diet for Katherine.

Dr Meyer measures Katherine's weight and height and determines her BMI. He assures Katherine and Mrs Gomez that Katherine's weight and height are within the normal range for her age. He also asks Katherine about

her eating behaviors and determines that they are appropriate. Dr Meyer advises Katherine to eat 3 meals a day and to eat nutritious snacks when she is hungry.



*Dr Meyer realizes that Katherine and her mother need additional information and guidance on anticipated physical changes and nutrition needs during adolescence.*



He suggests that she eat a wide variety of foods and choose fruits, vegetables, and low-fat and fat-free milk products as snacks rather than chips, candy, and soft drinks.

Dr Meyer realizes that Katherine and her mother need additional information and guidance on anticipated physical changes and nutrition needs during adolescence. He refers them to a dietitian for follow-up. He also makes a note in Katherine's chart to evaluate her height, weight, diet, and food intake during her next visit.

# Frequently Asked Questions About Nutrition in Adolescence

## ***How can I encourage my teenager to eat healthy foods?***

- Serve new foods and regional and ethnic foods.
- Shop for foods and cook together.
- Be a positive role model—practice healthy eating behaviors yourself.
- Don't fight over food with your teenager, and do not prepare separate foods for him.
- Keep a variety of healthy foods in the house. Limit the availability of foods (eg, candy, cookies) and beverages (eg, soft drinks) high in sugar and fat, especially saturated and trans fats.
- Plant a garden.

## ***How can our family eat healthy meals together when we are so busy?***

- Make food preparation and cooking an enjoyable family activity.
- Make simple meals (eg, salads, soups, sandwiches).
- Eat different meals together. For example, eat breakfast together one day and lunch or dinner the next.
- Buy healthy ready-to-eat foods from the store or healthy take-out foods from a restaurant.
- When your family eats together, use the time to socialize. Avoid distractions. Turn the television off, and don't answer the telephone.
- Try to prioritize family meals and strive to eat 4 meals (breakfast, lunch, or dinner) together a week.

## ***How can I get my teenager to eat breakfast?***

- Provide foods that are fast and convenient, (eg, bagels, low-fat granola bars, fruits, 100% fruit juice [limit to 6–8 oz per day], yogurt).
- Serve foods other than the usual breakfast foods (eg, sandwiches, baked potatoes, leftovers such as chicken or pasta).
- Help your teenager get organized so that she has time to eat in the morning.
- Make breakfast the night before.

- If your teenager is in a hurry, offer her foods such as fruits or trail mix to eat at school.
- See if your school offers a breakfast program.

## ***How can I get my teenager to eat more fruits and vegetables?***

- Keep a variety of fruits and vegetables at home.
- Put cut-up fruits and vegetables on the counter when you know your teenager will be hungry.
- Wash and cut up fruits and vegetables and keep them in the refrigerator, along with low-fat dip or salsa. Use a clear container so that the fruits and vegetables can be seen easily.
- Serve 2 or more vegetables with dinner, including at least one your teenager likes. Serve a salad with a choice of low-fat dressing.
- Use plenty of vegetables in soups, sauces, and casseroles.
- Pack fruits and vegetables in your teenager's bag to eat at school.
- Offer a variety of fruits and vegetables at meals and snacks, but don't force your teenager to eat them.
- Plant a garden.
- Be a good role model—eat more fruits and vegetables yourself.

## ***How can I help my teenager get enough calcium?***

- Serve foods that are rich in calcium, such as low-fat (1%) or fat-free (skim) milk products (eg, milk, cheese, cottage cheese, yogurt), tofu processed with calcium sulfate, broccoli, and collard and turnip greens.
- Use low-fat or fat-free milk products in recipes (eg, in puddings, milkshakes, soups, casseroles).
- If your teenager's digestive system cannot handle milk and milk products (ie, he is lactose intolerant), try these suggestions
  - Serve small portions of these foods throughout the day.
  - Serve these foods along with non-milk products.

- Serve lactose-free milk products, including milk and yogurt, and aged hard cheeses (eg, cheddar, Colby, Swiss, Parmesan) that are low in lactose. Add lactose drops to your teenager's milk.
- Give your teenager lactase tablets before he eats milk products containing lactose.
- Serve foods, such as 100% fruit juice and cereal products, with added calcium (calcium-fortified).
- If these ideas do not work, talk to a health professional about giving your teenager a calcium supplement.

### ***My teenager has become a vegetarian. Should I be concerned?***

- With careful planning, a vegetarian lifestyle can be healthy and meet teenagers' nutritional needs.
- A vegetarian diet that includes milk products and eggs usually provides adequate nutrients; however, your teenager may need to take an iron supplement.
- Vegans are strict vegetarians who don't eat any animal products, including dairy foods, eggs, and fish. They may need additional calcium, vitamin B<sub>12</sub>, and vitamin D, which can be provided by fortified foods and supplements.
- Instead of always preparing separate vegetarian meals for your teenager, occasionally fix vegetarian meals for the whole family.
- Ask a registered dietitian or nutritionist to help you plan healthy meals.

### ***How can I teach my teenager to make healthy food choices away from home?***

- Encourage your teenager to make healthy food choices when purchasing food at school, stores, and restaurants, and from vending machines.
- Review school and restaurant menus with your teenager, and discuss healthy food choices and appropriate portions. Find foods that are low in fat, sugar, and calories.
- Encourage your teenager to eat salads with low-calorie dressings, fruits, vegetables, and broiled or baked meats.
- Encourage your teenager to avoid eating fried foods or to reduce serving sizes (eg, by splitting an order of french fries with a friend).
- Teach your teenager to ask for changes to make foods healthier, such as asking the server to "hold the mayonnaise."

### ***My teenager snacks on chips and candy. What should I do?***

- Limit foods in your home that are high in fat, such as potato chips that are fried, and foods that are high in sugar, such as candy and sweetened beverages (eg, juice drinks, soft drinks).
- Keep a variety of easy-to-prepare and healthy foods on hand.
- Serve healthier foods (eg, whole-grain low-fat products, 100% fruit juice [limit to 6–8 oz per day], fruit, applesauce, vegetables, yogurt).
- Wash and cut up vegetables, and keep them in a clear container (so they can be seen easily) in the refrigerator, along with low-fat dip or salsa. Keep them at your teenager's eye level so they are the first thing he sees when he opens the fridge.
- Keep a bowl of fruit on the kitchen table or counter.
- Encourage your teenager to make healthy food choices when purchasing food at school, stores, and restaurants, and from vending machines.

### ***How can I help my teenager be more active?***

- Encourage spur-of-the-moment physical activity (eg, dancing to music).
- Limit your teenager's total entertainment media time (eg, watching television, playing computer or video games) to no more than 1 to 2 hours of quality programming a day. Don't put a television in your teenager's bedroom; if one is already there, remove it.
- For every hour your teenager reads, watches television, or plays computer or video games, encourage her to take a 10-minute physical activity break.
- Involve your teenager in family chores (eg, raking leaves, walking the dog).
- Make physical activity a part of your teenager's daily life. For example, use the stairs instead of taking an elevator or escalator, and walk or ride a bike instead of riding in a car.
- Encourage your teenager to enroll in planned physical activities, such as swimming, martial arts, or dancing.
- Be physically active together (eg, biking, playing ball, dancing, skating). It's a great way to spend time with your teenager.
- Take turns selecting physical activities that family members and friends can do together.

- Plan at least one special physical activity (eg, a hike, a bike ride) each week.
- Be a good role model—be physically active yourself.

### ***What should I do if my teenager is overweight?***

- If you are concerned about your teenager's weight, bring this to the attention of your teenager's health professional, and request an evaluation of your teenager's BMI.
- Never place your teenager on a diet to lose weight unless a health professional recommends one for medical reasons and supervises it.
- Focus on gradually changing the entire family's eating and physical activity behaviors.
- Serve healthy meals and snacks at scheduled times, but allow for flexibility.
- Limit foods (eg, candy, cookies) and beverages (eg, juice drinks, soft drinks) high in sugar and high-calorie, low-nutrient snacks.
- Limit most beverages to low-fat (1%) or non-fat (skim) milk, water, and 100% fruit juice (limited to 6 oz per day).
- Serve low-fat or non-fat milk products.
- Do not forbid sweets and desserts. Serve them in moderation.
- Look at school menus with your teenager, and discuss healthy food choices and appropriate portions.
- Plan family activities that everyone enjoys (eg, hiking, biking, swimming).
- Limit to 1 to 2 hours per day the amount of time your teenager watches television and plays computer games.
- Be a good role model—practice healthy eating behaviors and be physically active yourself. Teenagers need at least 60 minutes of moderate to vigorous activity each day.
- Work with your community to make sure that your teenager has safe places for being physically active (eg, walking and biking paths, playgrounds, parks).
- Do not make negative comments about your teenager's weight or allow other family members to tease the teenager about weight.

### ***How can I help my underweight teenager gain weight?***

- Limit the quantity of beverages your teenager drinks between meals if his appetite is being affected.
- Encourage your teenager to eat a midmorning snack at school, if possible, and an after-school snack. Limit snacks close to mealtimes if snacking is affecting his appetite.
- Have your teenager help with meal planning and food preparation.
- Continue to offer foods even if your teenager has refused to eat them before. Your teenager is more likely to accept these foods after they have been offered several times.

### ***How can I help my teenager like her body?***

- Teenagers are very sensitive about how they look. Do not criticize your teenager about her size or shape.
- Focus on traits other than appearance when talking to your teenager.
- Talk to your teenager about how the media affects his body image.
- Be a good role model—don't criticize your own size or shape or that of others.

### ***If you notice any of these symptoms, talk to a health professional about your concerns.***

#### **ANOREXIA NERVOSA**

- Excessive weight loss in a short period
- Continuation of dieting although thin
- Dissatisfaction with appearance; belief that body is fat even though extremely thin
- Loss of menstrual period
- Unusual interest in certain foods and development of unusual eating rituals
- Eating in secret
- Obsession with exercise
- Depression

#### **BULIMIA NERVOSA**

- Loss of menstrual period
- Unusual interest in certain foods and development of unusual eating rituals
- Eating in secret
- Obsession with exercise

- Depression
- Binge-eating
- Binge-eating with no noticeable weight gain
- Vomiting or laxative use
- Disappearance into bathroom for long periods (eg, to induce vomiting)
- Alcohol or drug abuse

### RESOURCES FOR FAMILIES

- Centers for Disease Control and Prevention. Division of Nutrition, Physical Activity and Obesity. <http://www.cdc.gov/nccdphp/dnpa>
- Centers for Disease Control and Prevention. *Eat a Variety of Fruits & Vegetables Every Day*. <http://www.fruitsandveggiesmatter.gov>
- International Food Information Council. *Kidnetic*. <http://www.kidnetic.com>
- Fletcher AM. *Weight Loss Confidential: How Teens Lose Weight and Keep It Off—And What They Wish Parents Knew*. New York, NY: Houghton Mifflin Company; 2006
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- Nader PR, Zive MM. *You Can Lose Your Baby Fat: New Rules to Protect Kids from Obesity—For Parents, Providers, and Others Who Care About Children and the Future of Our Society*. San Diego, CA: Phil Nader Publications; 2008
- National Institutes of Health, National Heart Lung, and Blood Institute. *We Can! Ways to Enhance Children's Activity & Nutrition*. <http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan>
- Nestle M. *What to Eat: An Aisle-by-Aisle Guide to Savvy Food Choices and Good Eating*. New York, NY: North Point Press; 2006
- Nemours Foundation. *KidsHealth*. <http://www.KidsHealth.org>
- Neumark-Sztainer D. *"I'm, Like, So Fat!": Helping Your Teen Make Healthy Choices About Eating and Exercise in a Weight-Obsessed World*. New York, NY: The Guilford Press; 2005
- Satter E. *Your Child's Weight: Helping Without Harming: Birth Through Adolescence*. Madison, WI: Kelcy Press; 2005
- US Department of Agriculture. *MyPyramid.gov*. <http://www.mypyramid.gov>
- US Department of Agriculture, Food and Nutrition Service. *Empowering Youth with Nutrition and Physical Activity*. <http://healthymeals.nal.usda.gov/hsmrs/EY>
- US Department of Agriculture, Food and Nutrition Service. *Loving Your Family, Feeding Their Future*. [http://snap.nal.usda.gov/nal\\_display/index.php?info\\_center=15&tax\\_level=3&tax\\_subject=261&topic\\_id=1941&level3\\_id=6322&level4\\_id=0](http://snap.nal.usda.gov/nal_display/index.php?info_center=15&tax_level=3&tax_subject=261&topic_id=1941&level3_id=6322&level4_id=0)
- US Department of Agriculture, Food and Nutrition Service. *Team Nutrition*. <http://www.fns.usda.gov/tn>
- US Department of Health and Human Service, Food and Drug Administration; US Department of Agriculture, Food and Nutrition Service. *The Power of Choice: Helping Youth Make Healthy Eating and Fitness Decisions*. Washington, DC: US Department of Health and Human Services, Food and Drug Administration; US Department of Agriculture, Food and Nutrition Service; 2008