



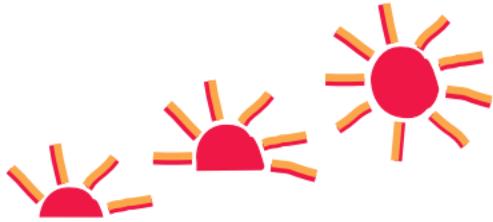
# Bright Futures

**in Practice:**

# NUTRITION

**Pocket Guide**





# **Bright Futures in Practice: Nutrition**

## **Pocket Guide**

Mary Story, Ph.D., R.D., Katrina Holt, M.P.H., M.S., R.D., Denise Sofka, M.P.H., R.D., Eileen M. Clark  
Editors

Supported by  
Maternal and Child Health Bureau  
Health Resources and Services Administration  
U.S. Department of Health and Human Services

Published by  
National Center for Education in Maternal and Child Health  
Georgetown University

### Cite as

Story M, Holt K, Sofka D, Clark EM, eds. 2002. *Bright Futures in Practice: Nutrition—Pocket Guide*. Arlington, VA: National Center for Education in Maternal and Child Health.

*Bright Futures in Practice: Nutrition—Pocket Guide* © 2002 by National Center for Education in Maternal and Child Health and Georgetown University. The Maternal and Child Health Bureau reserves a royalty-free, nonexclusive, and irrevocable right to use the work for federal purposes and to authorize others to use the work for federal purposes. Written requests for permission to duplicate and use all or part of the information and illustrations contained in this publication should be sent to NCEMCH at the address below. NCEMCH cannot grant permission to reproduce any material in the text noted as having been reprinted or adapted from another source (contact the original source for permission to reproduce these materials). We encourage requests for use of material in this publication, as the intent of the Bright Futures project is to disseminate its information as widely as possible in the hope that it will be used in many settings across the country.

Library of Congress Control Number 2002102634  
ISBN 1-57285-074-4

### *Published by*

National Center for Education in Maternal and Child Health  
Georgetown University  
2000 15th Street, North, Suite 701  
Arlington, VA 22201-2617  
(703) 524-7802 • (703) 524-9335 fax  
E-mail: [info@ncemch.org](mailto:info@ncemch.org)  
NCEMCH Web site: [www.ncemch.org](http://www.ncemch.org)  
Bright Futures Web site: [www.brightfutures.org](http://www.brightfutures.org)

### *Additional copies of this publication are available from*

Bright Futures Distribution Center  
c/o Rockville Mailing Service  
Dept. B, 751 East Gude Drive  
Rockville, MD 20850-1356  
(301) 279-8890 • (301) 559-5167 fax  
Bright Futures Web site: [www.brightfutures.org](http://www.brightfutures.org) (for order form)

This publication has been produced by the National Center for Education in Maternal and Child Health under its cooperative agreement (MCU-119301) with the Maternal and Child Health Bureau, Health Resources and Services Administration, U.S. Department of Health and Human Services.



# TABLE OF CONTENTS

About Bright Futures.....	iv
About <i>Bright Futures in Practice: Nutrition</i> .....	vi
How This Pocket Guide Is Organized .....	vii
Core Concepts .....	viii

## **Nutrition Supervision**

Infancy (0–11 Months).....	2
Early Childhood (1–4 Years) .....	24
Middle Childhood (5–10 Years).....	36
Adolescence (11–21 Years).....	44

## **Nutrition Issues and Concerns**

Diabetes Mellitus.....	54
Eating Disorders .....	56
Food Allergy.....	58
Hyperlipidemia.....	60
Iron-Deficiency Anemia .....	62
Lead Exposure .....	64
Obesity.....	66

## **Nutrition Tools**

Key Indicators of Nutrition Risk .....	70
Tips for Promoting Physical Activity.....	82
Tips for Promoting Food Safety .....	84



## ABOUT BRIGHT FUTURES

Bright Futures is a vision, a philosophy, a set of expert guidelines, and a practical developmental approach to providing health supervision for infants, children, and adolescents. Bright Futures is dedicated to the principle that every infant, child, and adolescent deserves to be healthy and that optimal health involves a partnership among health professionals, families, and communities.

### Mission

The mission of Bright Futures is to promote and improve the health, education, and well-being of infants, children, adolescents, families, and communities.

### Goals

- Foster partnerships between families, health professionals, and communities
- Promote desired social, developmental, and health outcomes in infants, children, and adolescents
- Increase family knowledge, skills, and participation in health promotion and disease prevention activities

- Enhance health professionals' knowledge, skills, and practice of developmentally appropriate health care in the context of family and community

### Objectives

- Develop materials and practical tools for health professionals, families, and communities
- Disseminate Bright Futures content, philosophy, and materials
- Train health professionals, families, and communities to work in partnership on behalf of children's health
- Develop and maintain public-private partnerships
- Evaluate and refine health promotion and disease prevention efforts

### Funding

Since its inception in 1990, Bright Futures has been funded by the U.S. Department of Health and Human Services, Health Resources and Services Administration's Maternal and Child Health Bureau.





## ABOUT *BRIGHT FUTURES IN PRACTICE: NUTRITION*

Optimal nutrition is important for sustenance, good health, and well-being throughout life. The nutrition status of infants, children, and adolescents affects their growth and development and resistance to disease. As the relationships among diet, health, and disease prevention have become clearer, nutrition and the promotion of healthy eating behaviors have received increased attention.

Lifelong eating behaviors are often established in early childhood. Therefore, it is important for children and adolescents to build the foundation for good health by choosing a healthy lifestyle, including practicing healthy eating behaviors and participating in regular physical activity.

### A Developmental and Contextual Approach

The guidelines in *Bright Futures in Practice: Nutrition* represent a developmental and contextual approach to helping children and adolescents develop positive attitudes toward food and practice healthy eating behaviors. The developmental approach, which is based on the unique social and psychological charac-

teristics of each developmental period, is critical for understanding children's and adolescents' attitudes toward food and for encouraging healthy eating behaviors. The contextual approach emphasizes the promotion of positive attitudes toward food and healthy eating behaviors by providing children, adolescents, and their families with consistent nutrition messages.

### Partnerships Among Health Professionals, Families, and Communities

Encouraging healthy eating behaviors in children and adolescents is a shared responsibility. One of the principles of *Bright Futures in Practice: Nutrition* is that, together, health professionals, families, and communities can make a difference in the nutrition status of infants, children, and adolescents.

Throughout the nutrition guide, we use the term "parent" to refer to the adult or adults responsible for the care of the infant, child, or adolescent. In some situations this person could be an aunt, uncle, grandparent, custodian, or legal guardian.



## HOW THIS POCKET GUIDE IS ORGANIZED

The pocket guide is based on *Bright Futures in Practice: Nutrition*. Presenting key information from the practice guide, the pocket guide serves as a quick reference and training resource for health professionals and students.

### Nutrition Supervision

This section outlines nutrition supervision for infancy, early childhood, middle childhood, and adolescence. Nutrition supervision includes interview questions, screening and assessment, and counseling.

### Nutrition Issues and Concerns

This section provides an overview of common nutrition issues and concerns that affect infants, children, and adolescents. Additional topics such as breastfeeding, hypertension, oral health, pediatric undernutrition, and children and adolescents with special health care needs are addressed in the practice guide.

### Nutrition Tools

This section provides tools to help promote the nutrition and physical activity status of infants, children, and adolescents.





## CORE CONCEPTS

**Q:** In today's complex and changing health care system, how can health professionals implement a Bright Futures approach within each visit?

**A:** By using an innovative health promotion curriculum developed specifically to help professionals integrate Bright Futures principles into practice.

This unique curriculum, developed by a health promotion work group supported by the Maternal and Child Health Bureau, includes 6 core concepts:

- Partnership
- Communication
- Health promotion/  
illness prevention
- Time management
- Education
- Advocacy

A summary of each of these core concepts is presented on the following pages to help all professionals, both experienced practitioners and those in training, bring Bright Futures alive and make it happen for children, adolescents, and families.

*For more information about this unique health promotion curriculum, please contact Henry H. Bernstein, Chair, Bright Futures Health Promotion Work Group, by phone (617) 355-7960 or by e-mail ([henry.bernstein@tch.harvard.edu](mailto:henry.bernstein@tch.harvard.edu)).*

## Using Open-Ended Questions Effectively

All 6 core concepts rely on the health professionals' skills in using open-ended questions to communicate effectively; partner with and educate children, adolescents, and their families; and serve as their advocates to promote health and prevent illness in a time-efficient manner.

Open-ended questions...

- Help to start the conversation
- Ask: "Why?" "How?" "What?"
- Are interpretive
- Have a wide range of possible answers
- Stimulate thinking
- Promote problem-solving

*Example:*

- "Evan, if you had 3 wishes, what would they be?"

Techniques

- Begin with affirming questions  
*Example: "Tell me some things you're really good at."*
- Wait at least 3 seconds to allow family to respond to question
- Ask questions in a supportive way to encourage communication



# BUILDING EFFECTIVE PARTNERSHIPS

A health partnership is a relationship in which participants join together to ensure health care delivery in a way that recognizes the critical roles and contributions of each partner (child, adolescent, family, health professional, and community) in promoting health and preventing illness. Following are 6 steps for building effective health partnerships.

## 1. Model and encourage open, supportive communication with child and family.

- Integrate family-centered communication strategies
- Use communication skills to build trust, respect, and empathy

## 2. Identify health issues through active listening and “fact finding.”

- Selectively choose Bright Futures general and age-appropriate interview questions
- Ask open-ended questions to encourage more complete sharing of information
- Communicate understanding of the issues and provide feedback

## 3. Affirm strengths of child and family.

- Recognize what each person brings to the partnership
- Acknowledge and respect each person’s contributions
- Commend family for specific health and developmental achievements

## 4. Identify shared goals.

- Promote view of health supervision as partnership between child, adolescent, family, health professional, and community
- Summarize mutual goals
- Provide links between stated goals, health issues, and available resources in community

## 5. Develop joint plan of action based on stated goals.

- Be sure that each partner has a role in developing the plan
- Keep plan simple and achievable
- Set measurable goals and specific timeline
- Use family-friendly negotiation skills to ensure agreement
- Build in mechanism and time for follow-up

## 6. Follow up: Sustaining the partnership.

- Share progress, successes, and challenges
- Evaluate and adjust plan
- Provide ongoing support and resources



## FOSTERING FAMILY-CENTERED COMMUNICATION

### Effective Behaviors

- Greet each family member and introduce self
- Use names of family members
- Incorporate social talk in the beginning of the interview
- Show interest and attention
- Demonstrate empathy
- Appear patient and unhurried
- Acknowledge concerns, fears, and feelings of child or adolescent, and family
- Use ordinary language, not medical jargon
- Use Bright Futures general and age-appropriate interview questions
- Give information clearly
- Query level of understanding and allow sufficient time for response
- Encourage additional questions
- Discuss family life, community, school

### Active Listening Skills: Verbal Behaviors

- Allow child or adolescent, and parents, to state concerns without interruption
- Encourage questions and answer them completely
- Clarify statements with follow-up questions
- Ask about feelings
- Acknowledge stress or difficulties
- Allow sufficient time for a response (wait time >3 seconds)
- Offer supportive comments
- Restate in the child's, adolescent's, or parent's words
- Offer information or explanations

### Active Listening Skills: Nonverbal Behaviors

- Nod in agreement
- Sit down at the level of the child or adolescent and make eye contact
- Interact with or play with the child
- Show expression, attention, concern, or interest
- Convey understanding and empathy
- Draw pictures to clarify
- Demonstrate techniques



# PROMOTING HEALTH AND PREVENTING ILLNESS

It is essential that health professionals identify and focus on the individual needs and concerns of the child and family, since families often hesitate to initiate discussion.

## 1. Identify relevant health promotion topics.

- Ask open-ended, nonjudgmental questions to obtain information and identify appropriate guidance

*Example:*

- “How is breastfeeding going? What questions/concerns do you have today?”

- Ask specific follow-up questions to communicate understanding and focus the discussion

*Example:*

- “How often and for how long do you breastfeed Manuel? How do you tell when he wants to be fed?”

- Listen for verbal and nonverbal cues to discover underlying or unidentified concerns

*Example:*

- “How do you balance your roles of partner and parent? When do you make time for yourself?”

*Note:*

- If parent hesitates with an answer, try to determine the reason.
- If parent brings in child multiple times for minor problems, explore the possibility of another unresolved concern.

## 2. Give personalized guidance.

- Introduce new information and reinforce healthy practices

*Examples:*

- Take time for self, time with partner.
- Encourage partner to help care for baby.
- Accept support from friends, family.

## 3. Incorporate family and community resources.

- Approach child or adolescent within context of family and community
- Identify each family member's role

*Examples:*

- “Who helps you with Kim?”
- “How much rest are you getting?”

- Identify community resources such as lactation consultant or local La Leche League chapter
- Develop working relationships with community professionals, and establish lines of referral
- Create a list of local resources with contact information

## 4. Come to closure.

- Be sure that the health message is understood

*Examples:*

- “Have I addressed your concerns?”
- “Do you have any other concerns about Kim's health?”

- Identify possible barriers

*Example:*

- “What problems do you think you might have following through with what we discussed today?”



## MANAGING TIME FOR HEALTH PROMOTION

### 1. Maximize time for health promotion.

- Use accurate methods that minimize documentation time
- Ask family to complete forms in waiting area
- Organize chart in consistent manner
- Scan chart before meeting with the child or adolescent, and family
- Train staff to elicit information and to provide follow-up with family

### 2. Clarify health professional's goals for visit.

- Review screening forms and other basic health data
- Observe parent-infant interaction
- Clarify key issues for visit  
*Example: Review age-appropriate anticipatory guidance.*
- Identify needs, then rank them in order of importance

### 3. Identify family's needs and concerns for visit.

- Selectively use Bright Futures general and age-appropriate interview questions
- Include open-ended questions to draw family into visit  
*Example: "Tell me about Sabrina's sleeping habits. What position does she sleep in?" (Elicits more than yes/no answer, and presents "teachable moment" on "Back to Sleep" and SIDS.)*

### 4. Work with the family to prioritize goals for visit.

- Explain purpose of visit (identify, address specific concerns and overall health and development)
- Identify family's and health professional's shared goals
- Prioritize needs through family-friendly negotiation  
*Example: "I appreciate your concerns about \_\_\_\_\_. While you are here, I would also like to talk about \_\_\_\_\_."*

### 5. Suggest other options for addressing unmet goals.

- Acknowledge importance of issues that could not be fully addressed during the visit
- Offer additional resources (hand-outs, audiotapes, videotapes, Web-based materials)
- Suggest a follow-up visit or phone call  
*Example: "I'm sorry we weren't able to talk about \_\_\_\_\_ during today's visit. Could I call you one afternoon next week to follow up on that?"  
Or: "Would you be able to come back next week so we could talk more about that?"*
- Provide referral to professional or community resource  
*Example: "I know we haven't had a chance to cover your concern about \_\_\_\_\_ today. Would you like to pursue it with a specialist in that area?"*



# EDUCATING FAMILIES THROUGH TEACHABLE MOMENTS

Teachable moments occur multiple times each day but often go unrecognized. Health visits present opportunities for the health professional to teach the child and family.

1. Recognize “teachable moments” in health visit
2. Clarify learning needs of child or adolescent, and family
3. Set a limited agenda and prioritize needs together
4. Select teaching strategy
5. Seek and provide feedback
6. Evaluate effectiveness of teaching

## Four characteristics of the teachable moment

- Provides “information bites” (small amounts of information)
- Is directed to the child’s, adolescent’s, or family’s specific need
- Is brief (e.g., a few seconds)
- Requires no preparation time

Teaching strategies	Advantages
■ <i>Telling</i> (explain, provide information, give directions)	Works well when giving initial explanations or clarifying concepts
■ <i>Showing</i> (demonstrate, model, draw)	Illustrates concepts for visual learners
■ <i>Providing resources</i> (handouts, videos, Web sites)	Serves as reference after family leaves the office/clinic
■ <i>Questioning</i> (ask open-ended questions, allow time for response)	Promotes problem-solving, critical thinking; elicits better information; stimulates recall
■ <i>Practicing</i> (apply new information)	Reinforces new concepts
■ <i>Giving constructive feedback</i> (seek family’s perspective, restate, clarify)	Affirms family’s knowledge; corrects misunderstandings



# ADVOCATING FOR CHILDREN, FAMILIES, AND COMMUNITIES

Health professionals can be involved in advocacy either at an individual level (e.g., obtaining services for a child, adolescent, or family) or at a local or national level (speaking with the media, community groups, or legislators).

## 1. Identify Family Needs or Concerns.

- Use open-ended questions to identify specific needs or concerns of the family

*Example: "What are some of the main concerns in your life right now?"*

- Choose a specific area of focus
- Clarify family's beliefs and expectations about the issue
- Determine what has been done to date, and what has (or hasn't) worked

*Example: Parents may have tried unsuccessfully to obtain services for their child.*

- Do some initial "fact finding" and obtain data

*Example: Contact board of education or local department of public health.*

- Talk with others, determine progress

*Example: Is there a local school coalition that addresses the issue?*

## 2. Assess the Situation.

- Determine existing community resources
- Learn the laws
- Review the data and resources to be sure they support the issue
- Assess political climate to determine support or opposition

*Example: Is this issue of interest to anyone else (school/early intervention teacher, local policymakers)? Who (or what) might oppose the advocacy efforts? Why?*

## 3. Develop a Strategy.

- Limit efforts to a specific issue
- Use existing resources
- Start with small steps, then build upon successes

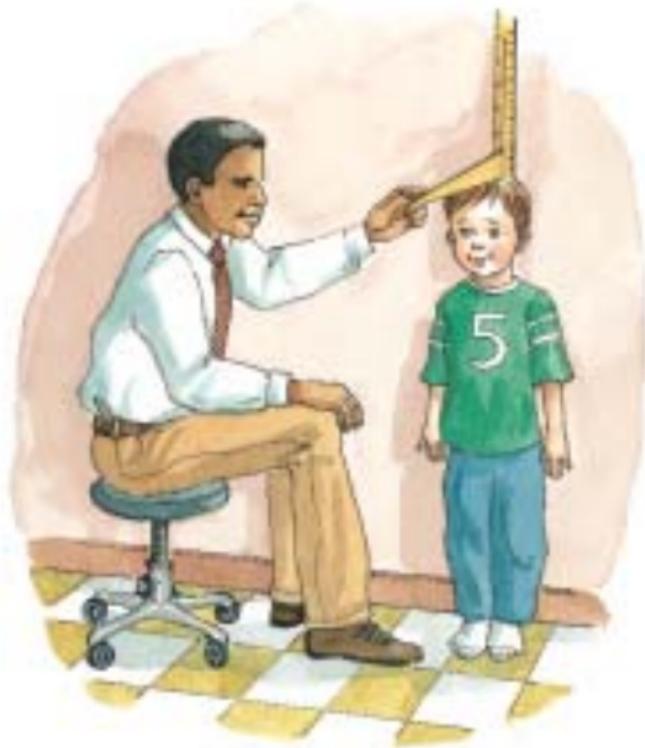
*Example: Obtaining special education services for a child rather than changing the laws*

*Examples: Write a letter to the school district. Attend the special education evaluation.*

## 4. Follow Through.

- Be passionate about the issue, but willing to negotiate
- Review the outcome
- Evaluate your efforts
- Determine next steps with family
- Recognize that health professionals and families can learn from one another about effective advocacy

# NUTRITION SUPERVISION





# INFANCY

## Overview

Infancy is divided into three stages. Physical growth, developmental achievements, nutrition needs, and feeding patterns vary significantly in each.

- **Early Infancy**—Birth to 6 months, when most rapid growth occurs
- **Middle Infancy**—6 to 9 months, when growth slows but is still rapid
- **Late Infancy**—9 to 12 months, when growth slows but infants' maturation and purposeful activity allow them to eat a wider variety of foods

## Weight

- Infants usually regain their birthweight by 10 to 14 days after birth.
- Infants typically double their birthweight by 4 to 6 months, gaining about 5 to 7 oz a week.
- Infants typically triple their birthweight by 1 year, gaining about 3 to 5 oz per week from 6 to 18 months.

## Length

- Infants gain approximately 1 inch per month from birth to 6 months.
- The rate of increase slows from 6 to 12 months as infants gain about  $\frac{1}{2}$  inch per month.
- Infants usually increase their length by 50 percent in the first year.

## Growth

To meet growth demands, infants require a high intake of calories and adequate amounts of fat, protein, vitamins, and minerals.

### *Calories*

- From birth to 6 months, infants require about 108 kcal/kg of body weight per day.
- By 12 months, caloric needs decrease to 100 kcal/kg of body weight per day.

### *Fats*

- Fats must constitute at least 30 percent of caloric intake to meet growth and development demands.



### *Vitamins and Minerals*

- Vitamin and mineral needs are usually met if the infant is breastfed by a well-nourished mother or receives correctly prepared infant formula.

### Physical Activity

- The first year of life is marked by dramatic changes in amount and type of physical activity displayed.
- Motor skill development begins with involuntary reflexes that ensure infant's survival. These reflexes disappear as infant gains voluntary control over the body.
- Infants usually acquire motor skills in the same order, but the rate at which they acquire them is individual.
- Physical activity should be promoted from the time infants are born.





## Common Nutrition Concerns

### Breastfeeding or Bottle Feeding

- Parents are often unsure whether breastfeeding or bottle feeding is best for their infant.
- Breastmilk is the ideal food for infants.
- The benefits of breastfeeding even for only a few weeks or months are innumerable.
- It is important to identify barriers to breastfeeding and provide referrals to lactation support services.

### Introducing Supplemental Foods

- Teach families when it is developmentally appropriate to introduce supplemental foods.
- Provide information on infant's nutrition needs and developmental abilities.
- Describe infant's developmental readiness to eat supplemental foods (at about 4 to 6 months).
  - Infant's sucking reflex allows coordinated swallowing.
  - Infant can sit with support.
  - Infant has good head and neck control.

### Infants with Special Health Care Needs

- Mothers may need extra emotional support, instruction about special techniques for positioning, or special equipment to help overcome breastfeeding problems.
- Address feeding challenges and identify resources to provide education and support.





## NUTRITION SUPERVISION THROUGHOUT INFANCY

An infant's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. Health professionals can do the following:

- Begin nutrition supervision by gathering information about infant's nutrition status by asking key interview questions. Continue by using screening and assessment and counseling guidelines.
- Recognize that interview questions, screening and assessment, and counseling should be used as appropriate and will vary from visit to visit and from infant to infant.

Information pertaining to the entire developmental period is provided first in the pocket guide, followed by information on age-specific visits.

### Interview Questions

- How do you think feeding is going? Do you have any questions about breastfeeding Shelley?
- How does Shelley let you know when she is hungry? How do you know when she has had enough to eat?
- How often does Shelley eat?
- Have you noticed changes in the way she eats?
- How do you feel about the way Shelley is growing?
- Are you concerned about having enough money to buy food or infant formula?
- What is the source of your drinking and cooking water? Do you use bottled or processed water?
- Do you have any questions or concerns about Shelley's development?
- What are some physical activities you do with her?

### Screening and Assessment

- Measure infant's length, weight, and head circumference and plot on standard growth chart to determine nutrition and growth status. Deviation from expected growth pattern should be evaluated. This may be normal or may indicate a nutrition problem.
- Evaluate appearance of infant's skin, hair, teeth, gums, tongue, and eyes.
- Assess infant for age-appropriate development.
- Observe parent-infant interaction and assess their responses to each other.



## Counseling

Discuss with All Parents:

### *Growth and Development*

- Not restricting infant's fat intake because fat is needed for growth and energy
- Allowing infant to develop feeding skills at own rate (If infant has significant delays in development of feeding skills, assessment by health professional is needed.)
- Infants' need for physical activity from the time they are born
- Nurturing motor skill development

### *Feeding Practices*

- Feeding infant iron-fortified formula rather than cow's milk if weaned from breastmilk before 12 months
- Using breastmilk or iron-fortified formula (not low-iron milk such as cow's, goat's, or soy) even in infant cereal until infant is 12 months

### *Food Safety*

- Discarding bottles of expressed breastmilk or open containers of ready-to-feed or concentrated formula stored in refrigerator for 48 hours or more; disposing of bottles of prepared formula stored in refrigerator more than 24 hours
- Dangers of warming expressed breastmilk, formula, or food in containers or jars in a microwave (Containers may feel cool, but contents can be too hot and cause burns.)
- Warming bottles by holding under hot water or placing in bowl of hot water for a few minutes
- Testing warmed fluids by sprinkling drops on wrist (If not lukewarm, they should be cooled down and tested again.)
- Food choking hazards (small, slippery foods such as hard candy, whole grapes, hot dogs; dry, difficult to chew foods such as popcorn, raw carrots, nuts; sticky, tough to break apart foods such as peanut butter, large chunks of meat)
- Not adding honey to food, water, or formula and avoiding processed foods containing honey (can be a source of spores that cause botulism poisoning in infants)



### *Supplements*

- Vitamin B<sub>12</sub> supplements for breastfed infant younger than 6 months if mother is vitamin B<sub>12</sub> deficient (eats no animal products, is undernourished, does not take B<sub>12</sub> supplements)
- Possible need for vitamin D supplements if infant is not exposed to adequate sunlight, especially if infant has very dark skin, lives in area with limited sunlight, or is kept covered because of cultural practices or beliefs

### *Common Concerns*

- Spitting up of a little milk at each feeding (Suggest burping infant several times during feeding and avoiding excessive movement after feeding.)
- Constipation (caused by not getting enough breastmilk or formula, receiving incorrectly prepared formula, or eating other foods too soon)
- Need for extra water or other fluids as directed by health professional for infant who has diarrhea, fever, or other illnesses

### *Oral Health*

- Cleaning infant's gums and teeth twice a day, using a washcloth on gums and soft toothbrush with water on teeth
- Avoiding habits harmful to infant's teeth (frequent, prolonged bottle feedings; feeding sugary, carbohydrate-rich snacks; giving bottles filled with anything but water to quiet infant or encourage sleep)
- Preventing early childhood caries (baby bottle tooth decay) by introducing a drinking cup at 6 months, weaning infant from bottle by 12 to 14 months, providing juice in cup instead of bottle, and limiting juice to 4 to 6 oz per day
- Using community water fluoridation as safe, effective way to reduce risk of early childhood caries in infants (If bottled water is preferred, recommend brand with fluoride added at a concentration of approximately 0.8 to 1.0 mg/L [ppm].)
- Providing fluoride supplementation for infant 6 months or older who receives breastmilk or formula prepared with water severely deficient in fluoride (less than 0.3 ppm)



## Discuss with Mothers of Breastfed Infants:

### *Feeding Practices*

- Benefits of breastfeeding exclusively for first 6 months (provides ideal nutrition, promotes best possible growth and development)
- Breastfeeding for 12 months or as long as mother and infant wish to continue
- Making breastfeeding more relaxing by feeding in quiet place and comfortable position
- Feeding infant on demand to stimulate lactation process (The longer infant sucks, the more breastmilk the mother's body makes. Manually expressing milk and using a breast pump is recommended to increase or maintain milk supply when mother is away from infant.)
- Allowing infant to finish feeding at one breast before offering the other breast (20 to 45 minutes provides adequate intake, allows mother time to rest between feedings)
- Frequency of feedings (typically 10 to 12 times in 24 hours)
- Not allowing infant to sleep more than 4 hours without breastfeeding in first 2 to 4 weeks

- Infant's growth periods and resulting need for more frequent feedings
- Breastfeeding more than one infant (Mother may need to eat more, receive additional nutrition counseling, or have extra help at home.)

### *Food Safety*

- Using refrigerated, expressed breastmilk within 48 hours (Safe storage time for frozen milk ranges from 2 weeks to 6 months, depending on freezer temperature.)

### *Maternal Eating Behaviors*

- Benefits of eating variety of healthy foods (helps mother stay healthy, infant grow)
- Drinking liquids such as milk or juice when thirsty and a glass of water at each feeding
- Limiting consumption of drinks containing caffeine (coffee, tea, soft drinks) to 2 per day
- Avoiding alcoholic beverages (If mother drinks, no more than 2 to 2<sup>1</sup>/<sub>2</sub> oz of liquor, 8 oz of wine, or 2 cans of beer should be consumed per day [less for small women].)

### ***Support***

- Encouraging father to help care for breastfed infant (bringing infant to mother at breastfeeding time; cuddling infant; helping with burping, diapering, bathing)
- Sources of breastfeeding information (physicians, nurses, nutritionists, lactation consultants, friends and family, support groups, La Leche League, educational materials)

### **Discuss with Parents of Formula-Fed Infants:**

#### ***Feeding Practices***

- Using iron-fortified formula as a substitute for breastmilk for full-term infant during first year
- Not adding cereal or other foods to formula
- Preparing and offering more formula as infant's appetite increases
- Holding infant close, in semi-upright position; looking into infant's eyes during feeding
- Checking for causes if infant is crying more than usual or seems to want to eat all the time

(uncomfortable feeding position, formula prepared incorrectly, bottle nipple too firm or hole too big, unheeded hunger cues, distracting feeding environment)

- Offering infant water on hot days between feedings (Infant doesn't usually need water.)

#### ***Food Safety***

- Preparing formula as instructed and following sanitary procedures (washing hands before preparing formula; cleaning area where formula is prepared; cleaning and disinfecting reusable bottles, caps, and nipples before each use; washing and drying top of formula container before opening)
- Discarding milk left in bottle when infant has finished eating; not reusing bottle that has been started
- Covering and refrigerating open containers of ready-to-feed or concentrated formula
- Storing powdered formula at room temperature





# PRENATAL

## Interview Questions

### For Pregnant Women

- Have you thought about breastfeeding?
- Do you know the benefits of breastfeeding for you and your baby?
- Do you have any concerns about your diet and breastfeeding?
- Do you restrict any foods in your diet for any reason?
- Does your family have a history of food allergies?
- Are you taking prenatal vitamins? Will you in the future?
- Do you take any vitamin or mineral supplements?
- Do you drink wine, beer, or other alcoholic beverages?
- Do you use any drugs (prescription, over-the-counter, illegal)?
- Do you have any questions about feeding your baby?
- What experiences have you had feeding babies?
- What does your partner or family think about your plan for feeding?

- Are you concerned about having enough money to buy food?
- Do you smoke? Does anyone smoke in your home?
- Do you have problems with your teeth?
- Does the water you drink or use to prepare foods contain fluoride?

### For Women Planning to Breastfeed

- Do you have any questions about breastfeeding?
- Have you attended breastfeeding classes?
- Will any family members or friends help as you are learning to breastfeed?
- Do you know how to contact support groups or lactation consultants?
- Do you know your HIV status?

### For Parents Planning to Formula-Feed

- What infant formula do you plan to use? Is the formula iron fortified?
- How will you prepare the formula?
- After the formula is made, how will you store it?
- Will any family members or friends help you feed your baby?

## Counseling

### Discuss with Pregnant Women:

- Intake of folic acid, before pregnancy and during the first trimester
  - Before pregnancy*—Recommend 400 µg per day of folic acid from fortified foods and/or supplements and a variety of foods containing folate.
  - During pregnancy*—Recommend intake of 600 dietary folate equivalents per day of food folate, folic acid, or mixture of both.
- Sources of folate including oranges, strawberries, spinach, avocados, turnip greens, asparagus, broccoli, Brussels sprouts, and beans (black, pinto, navy, kidney)
- Folic acid in fortified food products including grain products and most breakfast cereals
- Benefits of maintaining a healthy weight throughout pregnancy
- Harmful effects of drinking alcohol and smoking
- Good oral hygiene and dental care if needed
- Gradual weight loss after pregnancy (adjusting caloric intake, increasing level of physical activity)
- Moderate physical activity (walking, swimming) shortly after delivery

### Discuss with Women Planning to Breastfeed:

- Determining HIV status (If HIV positive, breastfeeding is contraindicated.)
- Advantages of rooming-in with newborns after delivery
- Breastfeeding as soon as possible after birth, usually within first hour
- When to breastfeed and how to identify hunger signs (hand-to-mouth activity, rooting, pre-cry facial grimaces, fussing, crying); crying is last indicator of hunger
- Breastfeeding about 10 to 12 times every 24 hours
- Not giving supplemental water, glucose, or formula unless required medically

### Discuss with Parents Planning to Formula-Fed:

- Preparing 2 oz of infant formula every 2 to 3 hours (more if infant seems hungry)
- Avoiding habits harmful to infant's teeth (putting infant to bed with a bottle, propping bottle in her mouth)





# NEWBORN

## Interview Questions

### For Parents of All Infants

- What is the longest time Amanda has slept at one time?
- How much rest are you getting?
- How many wet diapers does Amanda have each day?
- Do you burp her during or after a feeding?
- Is anyone helping you feed Amanda?

### For Mothers of Breastfed Infants

- Do you have any questions about breastfeeding?
- Do you need any help with breastfeeding?
- How often do you feed Edward? How do you know when he is hungry?
- Does Edward attach to your breast and suck well? Does he make swallowing sounds when you breastfeed him?
- Have you had any problems with your breasts or nipples (tenderness, swelling, pain)?
- Do you restrict any foods in your diet?
- What vitamin and mineral supplements do you take or plan to take?
- Do you drink wine, beer, or other alcoholic beverages?

- Do you use any drugs (prescription, over-the-counter, illegal)?
- Do you know your HIV status?

### For Parents of Formula-Fed Infants

- What infant formula do you use? Is the formula iron fortified?
- How do you prepare the formula?
- How do you store the formula after you make it?
- How do you clean the nipples, bottles, and other equipment before and after a feeding?
- What do you do with the milk in the bottle after a feeding?
- How do you hold Amanda when you feed her?

## Screening and Assessment

- Perform metabolic screening as indicated by the state.
- If mother does not know her HIV status, suggest HIV screening.
- If possible, observe mother breastfeeding infant. Assess mother's comfort in feeding, eye contact between mother and infant, mother's interaction with infant, mother's and infant's responses to distractions, and infant's ability to suck. Help mother and infant develop successful breastfeeding behaviors.

## Counseling

### Discuss with Parents:

- Feeding infant when she is hungry, usually 10 to 12 times in 24 hours
- Signs of hunger (hand-to-mouth activity, rooting, pre-cry facial grimaces, fussing, crying)
- Waking infant for feeding during first 2 weeks if he sleeps more than 4 hours at a time
- Feeding infant until she is full
- Signs of fullness (turning head away from nipple, closing mouth, showing interest in things other than eating)
- Burping infant at natural breaks midway through or after a feeding, gently rubbing or patting infant's back while holding him against the shoulder and chest or supporting him in sitting position on lap
- Evidence that infant is getting enough milk (swallowing sounds, 6 to 8 wet cloth diapers or 5 or 6 wet disposable diapers per day, weight gain)
- Breastfeeding infant exclusively for first 6 months
- Benefits of breastfeeding (provides ideal nutrition, promotes best possible growth and development)

- Not giving water, juice, or other foods to breastfed infant
- No need for fluoridated water or fluoride supplements during first 6 months





## WITHIN 1 WEEK

### Interview Questions

#### For Parents of All Infants

- Do you burp Claire during or after a feeding?
- Is anyone helping you feed her?
- How many wet diapers and bowel movements does Claire have each day?

#### For Mothers of Breastfed Infants

- Have you noticed changes in your milk?
- Have your breasts or nipples been sore?
- How often do you feed Spencer? How long do you feed him each time?
- Does Spencer suck well? Does he latch on well and breastfeed in a rhythm?
- Do you have any concerns or questions about what you are eating?

#### For Parents of Formula-Fed Infants

- What formula do you feed Claire? Is the formula iron fortified?
- How often do you feed Claire? How much does she eat at a feeding?

- How do you hold Claire while feeding? How do you hold the bottle?
- How do you know if Claire is hungry? If she has had enough to eat?
- Do you think the bottle nipples you are using are appropriate for Claire?

### Screening and Assessment

- Perform metabolic screening as indicated by the state.
- Assess infant for weight gain, milk intake, hydration, jaundice, and age-appropriate elimination patterns (6 to 8 wet cloth diapers or 5 or 6 wet disposable diapers per day and 3 or 4 stools per day by 5 to 7 days of age).
- If possible, observe mother breastfeeding infant. Assess mother's comfort in feeding, eye contact between mother and infant, mother's interaction with infant, mother's and infant's responses to distractions, and infant's ability to suck. Help mother and infant develop successful breastfeeding behaviors.
- If infant has a weak suck, investigate whether it is caused by immaturity or a neurological problem and whether it will compromise infant's food intake and ability to gain weight.

## Counseling

### Discuss with Parents:

- Feeding infant when she is hungry, usually 10 to 12 times in 24 hours
  - Signs of hunger (hand-to-mouth activity, rooting, pre-cry facial grimaces, fussing, crying)
  - Waking infant for feeding during first 2 weeks if he sleeps more than 4 hours at a time
  - Feeding infant until she is full
  - Signs of fullness (turning head away from nipple, closing mouth, showing interest in things other than eating)
- Burping infant at natural breaks midway through or after a feeding, gently rubbing or patting infant's back while holding him against the shoulder and chest or supporting him in sitting position on lap
  - Evidence that infant is getting enough milk (6 to 8 wet cloth diapers or 5 or 6 wet disposable diapers per day, 3 or 4 stools per day, weight gain)
  - No need for fluoridated water or fluoride supplements during first 6 months
  - Removing distractions such as lights and noise
  - Helping infant focus on feeding by rocking, patting, stroking, or swaddling, or feeding in a room with fewer distractions





## 2 WEEKS–2 MONTHS

### Interview Questions

#### For Parents of All Infants

- Have you offered Morgan anything other than breast-milk or formula?
- Is anyone helping you feed her?
- What is the longest Morgan has slept at one time?
- Does she ever seem to want to eat all the time? If so, what do you do?
- Do you burp Morgan during or after a feeding?
- How many wet diapers does she have each day?
- Have you had a postpartum checkup?

#### For Mothers of Breastfed Infants

- Do you have any questions about breastfeeding?
- How often do you feed Fernando? How long do you feed him each time?
- Are you planning to return to work or school? If so, will you express your breastmilk? How will you store it? How long will you keep it?
- Has Fernando had any formula in addition to breast-milk?

#### For Parents of Formula-Fed Infants

- What formula are you feeding Morgan? Is it iron fortified?
- How often do you feed her? How much does she eat at a feeding?
- How long does it take to feed Morgan?
- Have you offered her anything other than formula?
- What do you do with milk left in the bottle after a feeding?
- Do you prop the bottle or let Morgan feed herself?
- Do you put her to bed with a bottle?

### Screening and Assessment

- Perform metabolic screening as indicated by the state.
- If possible, observe mother breastfeeding infant. Assess mother's comfort in feeding, eye contact between mother and infant, mother's interaction with infant, mother's and infant's responses to distractions, and infant's ability to suck. Help mother and infant develop successful breastfeeding behaviors.
- Assess need for vitamin D or iron supplementation.

## Counseling

### Discuss with Parents:

- Feeding infant when she is hungry, usually 10 to 12 times in 24 hours
  - Signs of hunger (hand-to-mouth activity, rooting, pre-cry facial grimaces, fussing, crying)
  - Feeding infant until he is full
  - Signs of fullness (turning head away from nipple, closing mouth, showing interest in things other than eating)
  - Burping infant at natural breaks midway through or after a feeding, gently rubbing or patting infant's back while holding her against the shoulder and chest or supporting her in sitting position on lap
  - Infant growth spurts between 2 and 4 weeks of age and increased milk intake
  - Forgoing food other than breastmilk or formula until infant is developmentally ready: when sucking reflex allows coordinated swallowing and infant can sit with support and has good head and neck control (about 4 to 6 months)
- Indications of colic including crying inconsolably for several hours a day, passing a lot of gas (Recommend short, frequent feedings for a breastfed infant and eliminating some foods such as cow's milk, wheat, peanuts, eggs, seafood from mother's diet.)
  - Frequency of breastfed infant's stools (as few as 1 every 3 days in infant 6 weeks and older)
  - Distractions while feeding infants and the need for gentle, repetitive stimulation (rocking, patting, stroking) during feedings
  - No need for fluoridated water or fluoride supplements during first 6 months
  - Playing with infant to stimulate nervous system and help develop head and neck control and motor skills
  - Encouraging infant to follow objects with her eyes





## 4 MONTHS

### Interview Questions

#### For Parents of All Infants

- Can Carmen wait without crying while you get ready to feed her?
- Have you given her any food besides breastmilk or formula?
- Does Carmen seem interested in the food you eat?
- Have you offered her foods from the family meal? If so, which ones?
- Do you have any concerns about what, how, or how much Carmen eats?
- Do you know what she is fed when she is away from home (at child care, relative's home)?
- Does Carmen have any teeth?

#### For Mothers of Breastfed Infants

- Do you have any questions about breastfeeding?
- How often does Ajay breastfeed? How long do you feed him each time?
- Does he breastfeed more often or for longer periods of time? Can you keep up with his demand?

- Has Ajay received breastmilk or other fluids from a bottle?
- Are you planning to return to work or school? If so, will you express your breastmilk? How will you store it? How long will you keep it?

#### For Parents of Formula-Fed Infants

- What formula are you feeding Carmen? Is it iron fortified?
- How often do you feed her? How much does she eat at a feeding?
- Have you offered Carmen anything other than formula?
- What do you do with formula left in the bottle after a feeding?
- Do you have any concerns about the formula (cost, preparation, amount, nutrient content)?

### Screening and Assessment

- Assess the need for vitamin D and iron supplementation.

## Counseling

### Discuss with Parents:

- Forgoing food other than breastmilk or formula until infant is developmentally ready: when sucking reflex allows coordinated swallowing and infant can sit with support and has good head and neck control (about 4 to 6 months)
- Disadvantages of giving supplemental foods before infant is developmentally ready
- Introducing new foods one at a time and observing infant for 7 days or more after each new food to ensure there is no adverse reaction
- Introducing iron-fortified, single-grain infant cereal as the first supplemental food because it is least likely to cause an allergic reaction
- Introducing pureed or soft fruits, vegetables, and meats after infant has accepted iron-fortified, single-grain infant cereal
- Iron-fortified cereals and meats are good choices of supplemental foods high in iron
- Avoiding canned spinach, beets, turnips, carrots, and collard greens for infant younger than 6 months because excess nitrate can cause “blue baby” syndrome

- Drooling at 3 to 4 months as infant’s salivary glands become more active
- Talking to infant during feedings and encouraging social interaction
- No need for fluoridated water or fluoride supplementation during first 6 months
- Using infant toys to encourage development of skills infant uses when self-feeding





## 6 MONTHS

### Interview Questions

#### For Parents of All Infants

- Can Rebecca wait without crying while you get ready to feed her?
- When does Rebecca have something to eat or drink? How much does she eat or drink at a time? What does she do when she has had enough to eat?
- How does Rebecca let you know when she likes a certain food? Does she have favorite foods? If so, what are they?
- Has she eaten any foods from the family meal? If so, which ones?
- Has Rebecca fed herself anything?
- Do you know what Rebecca is fed when she is away from home (at child care, relative's home)?
- Has Rebecca's first tooth erupted? Has she had any teething problems?

#### For Mothers of Breastfed Infants

- Do you have any questions about breastfeeding?
- How often does Paul breastfeed? How long do you feed him each time?

- Has he received breastmilk or other fluids from a bottle or cup?
- Have you given Paul formula or cow's, goat's, or soy milk?

#### For Parents of Formula-Fed Infants

- How often do you feed Rebecca? How much formula does she drink at a time?
- Have you offered her anything other than formula?
- Does Rebecca want to help hold her bottle?
- Do you have any concerns about the formula (cost, preparation, amount, nutrient content)?
- Does the water you use to prepare the formula contain fluoride?

### Screening and Assessment

- Assess the need for vitamin D and iron supplementation.
- Assess all sources of water used by family (municipal, well, bottled, home system-processed) and ready-to-feed formula manufactured without fluoridated water to determine the need for fluoride supplements. If infant is not getting enough fluoride, refer to a dentist or primary care health professional.

## Counseling

### Discuss with Parents:

- Introducing supplemental foods when infant is developmentally ready: when sucking reflex allows coordinated swallowing and infant can sit with support and has good head and neck control (about 4 to 6 months)
  - Offering new foods one at a time and observing infant for at least 7 days after each new food to ensure there is no adverse reaction
  - Introducing iron-fortified, single-grain infant cereal as first supplemental food because it is least likely to cause allergic reaction
  - Introducing pureed or soft fruits, vegetables, and meats after infant has accepted iron-fortified, single-grain infant cereal
  - Iron-fortified infant cereals and meats are good choices of supplemental foods high in iron
  - Serving fruits and vegetables rich in vitamin C to help infant absorb iron
- Feeding infant a variety of foods to ensure a balanced diet and promote healthy eating behaviors
  - Using a spoon and placing infant in sitting position when offering new foods
  - Not forcing infant to eat new foods he does not like (It may take 15 to 20 attempts before he accepts a new food.)
  - Not adding salt, spices, or sugar to infant's food
  - Offering finger foods (cereal, crackers) when infant can eat solid foods
  - Reducing use of store-bought and home-prepared baby food once infant can eat soft foods
  - Using a highchair to allow infant to be part of family meals (Recommend safety belt to prevent infant from falling.)
  - Cleaning infant's gums and teeth twice a day, using a washcloth on gums and soft toothbrush with water on teeth
  - Family play time with infant, benefits of playing with toys and with others





## 9 MONTHS

### Interview Questions

#### For Parents of All Infants

- When does Bonnie have something to eat or drink? How much does she eat or drink at a time? What does she do when she has had enough to eat?
- Is Bonnie interested in feeding herself?
- What foods does she eat with her fingers? Has she used a cup?
- Is Bonnie interested in the food you eat?
- Do you know what she eats when she is away from home (at child care, relative's home)?
- Is Bonnie drinking less breastmilk or formula?
- Has she ever choked or gagged on food?
- Has Bonnie's first tooth erupted? Does she have any teething problems?

#### For Mothers of Breastfed Infants

- How often does Juan breastfeed? How long do you feed him each time?
- How is your milk supply?
- Has Juan had formula or cow's, goat's, or soy milk?

#### For Parents of Formula-Fed Infants

- How much formula does Bonnie drink?
- Are you using fluoridated water to prepare her formula?
- Do you have any questions about weaning Bonnie from the bottle?

### Screening and Assessment

- Screen infant for iron-deficiency anemia if any risk factors are present. (See Iron-Deficiency Anemia, pp. 62–63.)
- Screen infant for lead exposure. (See Lead Exposure, pp. 64–65.)
- Assess need for neurological evaluation if infant stiffens during feeding, retains oral reflexes such as rooting, experiences delays in learning feeding skills, has difficulty swallowing, or refuses textured foods when developmentally ready.
- Assess all sources of water used by family (municipal, well, bottled, home system–processed) and ready-to-feed formula manufactured without fluoridated water to determine need for fluoride supplements. If infant is not getting enough fluoride, refer to a dentist or primary care health professional.

## Counseling

### Discuss with Parents:

- Offering soft, moist foods (mashed potatoes, cooked vegetables, rice, tuna, spaghetti with sauce) as infant changes from gumming to chewing foods
  - Giving infant small pieces of soft food when she is able to pick up and hold foods
  - Need for patience and understanding as infant tries new foods and learns to feed self
  - Removing distractions so infant stays focused on food
  - Using a highchair to allow infant to be part of family meals (Recommend safety belt to prevent infant from falling.)
  - Cleaning infant's gums and teeth twice a day, using a washcloth on gums and soft toothbrush with water on teeth
  - Encouraging infant's use of a cup with assistance
  - Giving infant midmorning, afternoon, and bedtime snacks
- Determining what and how much infant eats if she is fed away from home
  - Supporting infant physically as she plays and explores new strength and agility
  - Dangers of using infant walkers (risk of injury or death)





# EARLY CHILDHOOD

## Overview

Early childhood is divided into two stages:

- **Toddler**—Ages 1 to 2, characterized by a developing sense of independence as well as possible struggles over food
- **Young Child**—Ages 3 to 4, marked by competency in self-feeding, interest in new foods, and enjoyable participation in family meals

## Growth and Physical Development

- Growth rates and energy needs decrease during early childhood.
- Children quadruple birthweight by 2 years of age.
- Children gain an average of 4 1/2 to 6 1/2 pounds per year between the ages of 2 and 5.
- Children grow 2 1/2 to 3 1/2 inches per year between the ages of 2 and 5.
- Physical, cognitive, social, and emotional development are tightly linked.





## Eating Behaviors

- Toddlers tend to be leery of new foods and may refuse to eat them. They need to look at new foods and touch, smell, feel, and taste them, sometimes many times before they accept them.
- Toddlers will consume a variety of foods if parents continue to serve developmentally appropriate meals and snacks.
- Parents need to provide a structured, but pleasant, mealtime environment to help toddlers establish healthy eating behaviors.
- Young children are curious about new foods, but they may be reluctant to try them.
- Young children should be encouraged to try a variety of healthy foods.
- Parents decide what, when, and where children eat; children decide whether to eat and how much.

## Physical Activity

- Early childhood is an ideal time for promoting development of motor skills.
- Fundamental motor skills (walking, running, galloping, jumping, hopping, skipping, throwing, catching, striking, kicking, balancing) begin to develop.
- If children are physically active, motor skills can develop into advanced patterns of motor coordination.
- Simple games (“Simon Says,” chase, tag) and certain organized activities (gymnastics, swimming, dancing) are appropriate.
- Children are not ready for organized, competitive sports, which require visual acuity, control, and balance.



## Common Nutrition Concerns

### Food Intake

- Children need to consume enough calories and nutrients to support their growth and development.
- Before 2 years of age, children's fat intake should not be restricted.
- After age 2, children should gradually eat fewer high-fat foods.
- By age 5, children's fat intake should be no more than 30 percent of their daily calories.
- As children consume fewer calories from fat, they should eat more grain products, fruits, vegetables, low-fat dairy products, lean meats, and other protein-rich foods.

### Iron-Deficiency Anemia

- Iron-deficiency anemia is common in children and may have adverse effects on growth and development.
- Prevalence of iron-deficiency anemia is especially high among children from families with low incomes.

- Risk of iron-deficiency anemia can be reduced if parents wait until children are 12 months of age before offering them cow's milk and limiting the amount of milk to 16 oz per day.
- Children's absorption of iron is enhanced when they consume iron-rich foods (meat, fish, poultry) and foods that contain vitamin C (fruits, vegetables).

### Children with Special Health Care Needs

Children with special health care needs may have nutrition concerns, including poor growth, poor eating skills, inadequate food intake, developmental delays, elimination problems, and metabolic disorders. They may need specialized care from a dietitian or referral to early intervention programs or specialized clinics.

# NUTRITION SUPERVISION THROUGHOUT EARLY CHILDHOOD



A child's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. Health professionals can do the following:

- Begin nutrition supervision by asking key interview questions. Continue by using screening and assessment and counseling guidelines.
- Recognize that interview questions, screening and assessment, and counseling should be used as appropriate and will vary from visit to visit and from child to child.

Information pertaining to the entire developmental period is provided first in the pocket guide, followed by information on age-specific visits.

## Interview Questions

- Do you have any concerns about Marla's eating behaviors or growth?
- How do you know when she is hungry? When she is full?
- What do you do if Marla doesn't like a food?
- Do you enjoy sharing meals and snacks with her?

- Do you have equipment for feeding Marla (cups, utensils, highchair, booster seat)?
- Do you have concerns about 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?
- Do you have any questions or concerns about Marla's development?
- Do you have any questions or concerns about her participation in physical activity?
- Which physical activities does Marla participate in? How often? For how long each time?



## Screening and Assessment

- Measure child's length or height and weight and plot on standard growth chart to determine nutrition and growth status. Deviation from expected growth pattern should be evaluated. This may be normal or may indicate a nutrition problem.
- Use body mass index (BMI) to determine nutrition status and overall health. Calculate BMI by dividing weight by square of height ( $\text{kg}/\text{m}^2$ ) or by referring to BMI chart. Compare BMI to norms listed for sex and age on chart.
- Evaluate appearance of child's skin, hair, teeth, gums, tongue, and eyes.
- Evaluate child's eating skills (chewing, swallowing).
- Assess all sources of water used by family to determine need for fluoride supplements. If child is not getting enough fluoride, refer to a dentist or primary care health professional.
- Assess eating behaviors for risk of early childhood caries (baby bottle tooth decay) and ask about regular dental checkups.

## Counseling

Discuss with Parents:

### *Parent-Child Feeding Relationship*

- Determining what, when, and where child eats
- Allowing child to decide whether to eat and how much
- Meeting child's nutrition needs by purchasing and preparing foods

### *Eating Behaviors*

- Serving healthy, developmentally appropriate meals and snacks at scheduled times
- Coping with unpredictable eating behaviors (amount and types of foods eaten) from meal to meal and day to day
- Providing child 2 to 3 years of age with same number of servings as child 4 to 6, but with smaller portions (about  $\frac{2}{3}$  of a serving)
- Serving child 4 years of age portions similar to those eaten by older family members ( $\frac{1}{2}$  cup fruits or vegetables,  $\frac{3}{4}$  cup juice, 1 slice bread, 2 to 3 oz cooked lean meat, poultry, or fish)



- Serving whole milk to child 1 to 2 years of age; serving reduced-fat (2 percent), low-fat (1 percent), or fat-free (skim) milk to older child
- Weaning child from bottle by 12 to 14 months
- Serving juice in cup; limiting consumption to 4 to 6 oz per day
- Reducing risk of early childhood caries, minor infections, loose stools, and diarrhea by not allowing child to drink fruit juices or sweetened beverages whenever he wants
- Maintaining child's appetite for healthy foods by limiting foods and beverages high in sugar
- Encouraging child to drink plenty of water throughout day

### ***Meals and Snacks***

- Making meals and snacks pleasant, social experiences
- Sharing meals and snacks with child (Children eat better if an adult is nearby.)
- Teaching child to serve herself at the table
- Offering a variety of healthy foods and allowing child to choose which ones to eat
- Having patience and understanding as child learns to feed herself or makes a mess

- Offering small portions (1 or 2 tablespoons) of new foods
- Being positive role models by eating new foods
- Not pressuring child to eat certain foods or more than she wants
- Not using foods to reward, bribe, punish, calm, comfort, or entertain child
- Offering dessert (custard, pudding, fruit, yogurt) as part of the meal

### ***Food Safety***

- Following food safety practices to reduce child's risk of foodborne illness
- Using highchair when feeding child
- Taking precautions to prevent choking (staying with child when he eats, having child sit while eating, keeping things calm during meals and snacks, not letting child eat in car)
- For children under 3, avoiding foods that may cause choking; for children between 3 and 5, modifying these foods to make them safer
- Special techniques for positioning, special equipment, and modified utensils to help child with special health care needs eat



### *Teaching Children About Food*

- Serving a variety of healthy foods
- Offering foods from other cultures
- Teaching child where foods come from, such as how fruits and vegetables are grown
- Involving child in food shopping and preparation

### *Physical Activity*

- Ensuring that child participates in physical activity on most, if not all, days of the week
- Playing with child, parental participation in physical activity
- Planning family activities each week to encourage physical activity
- Allowing child to decide which physical activities family will do (raking leaves, walking dog, hiking, playing tag)
- Taking part in community projects as a family (cleanup days, community gardens)

### *Oral Health*

- Limiting consumption of candy, dried fruit, and foods that stick to teeth to prevent early childhood caries

- Using community water fluoridation as safe, effective way to reduce risk of early childhood caries (If bottled water is preferred, recommend a brand with fluoride added at a concentration of approximately 0.8 to 1.0 mg/L [ppm].)
- Providing fluoride supplementation if water is severely deficient in fluoride (less than 0.3 ppm for child 6 months to 3 years, less than 0.6 ppm for child 3 to 6 years)
- Cleaning child's teeth twice a day with small, soft toothbrush, using pea-size amount of fluoridated toothpaste, when child is 2 years of age; consulting child's dentist or primary care health professional about use of fluoridated toothpaste if child is younger than 2
- Supervising while child brushes teeth (Children younger than 6 are at risk for enamel damage if they swallow too much fluoridated toothpaste.)
- Preventing injuries to child's mouth, teeth, oral tissues, and jaws by using safety belt in shopping cart, safety seat in car or truck, and baby gates at top and bottom of stairs

# 1 YEAR

## Interview Questions

- Are you breastfeeding Rhonda?
- What type of formula or milk do you feed her?
- How much fruit juice and how many sweetened drinks (fruit punch, soft drinks) does Rhonda drink?
- Does Rhonda drink from a cup? Does she drink from a bottle now and then? If so, what are your plans for weaning her from the bottle?
- What textures of food does Rhonda eat? Does she eat pieces of soft food?
- Does she eat meals with the family?

## Screening and Assessment

- Screen child for iron-deficiency anemia if any risk factors are present. (See Iron-Deficiency Anemia, pp. 62–63.)
- Screen child for lead exposure. (See Lead Exposure, pp. 64–65.)
- Evaluate child's progress in developing eating skills (bites off small pieces of food, puts food in mouth, drinks from cup).

## Counseling

### Discuss with Parents:

- Giving child opportunities to feed himself at family table
- Offering child a variety of foods to help him develop eating skills (chewing, swallowing)
- Serving beverages in a cup (Child may need help drinking from cup.)
- Serving child a variety of soft foods
- Coping with unpredictable eating behaviors (amount and types of foods eaten) from meal to meal and day to day (Children usually eat enough food to meet their nutrition needs.)
- Offering child food every 2 to 3 hours (Children's capacity to eat at any one time is limited.)
- Handling child's limit-testing behaviors (asking for certain foods and throwing tantrums when refused)
- Imposing limits on unacceptable behaviors during meals and snacks without controlling amount or types of foods child eats
- Cleaning child's teeth twice a day with small, soft toothbrush and water





## 15 MONTHS

### Interview Questions

- Are you breastfeeding Christopher? Are you giving him milk in a bottle? Milk in a cup? What kind of milk does he drink? How much?
- How much fruit juice and how many sweetened drinks (fruit punch, soft drinks) does Christopher drink? When does he drink them?
- Which foods does Christopher like to eat? Are there any foods he doesn't like?
- Does Christopher eat meals with the family?
- Does he ask for food between meals and snacks? If so, how do you handle this?
- Does Christopher throw tantrums over food? If so, how do you handle them?

### Screening and Assessment

- Screen child for iron-deficiency anemia if any risk factors are present. (See Iron-Deficiency Anemia, pp. 62–63.)

### Counseling

#### Discuss with Parents:

- Offering child food every 2 to 3 hours (Children's capacity to eat at any one time is limited.)
- Providing relaxed atmosphere during meals and snacks as child tries new foods
- Being patient as child's skills at eating a variety of foods increases
- Making eating easier for child by using spoons, cups, and dishes with steep sides (bowls)
- Cleaning child's teeth twice a day with small, soft toothbrush and water

# 18 MONTHS

## Interview Questions

- Are you breastfeeding Mia? Are you giving her milk in a bottle? Milk in a cup? What kind of milk does she drink? How much?
- How much fruit juice and how many sweetened drinks (fruit punch, soft drinks) does Mia drink? When does she drink them?
- Which foods does Mia like to eat? Are there any foods she doesn't like?
- Does Mia eat meals with the family?
- Does she ask for food between meals and snacks? If so, how do you handle this?
- Does Mia throw tantrums over food? If so, how do you handle them?

## Screening and Assessment

- Use the screening and assessment guidelines in the Nutrition Supervision Throughout Early Childhood section, pp. 27–30.

## Counseling

### Discuss with Parents:

- Offering child food every 2 to 3 hours (Children's capacity to eat at any one time is limited.)
- Giving child opportunities to feed herself at family table
- Serving child a variety of foods to help her develop eating skills (chewing, swallowing)
- Providing forks and spoons designed for child (smaller, easier to use)
- Cleaning child's teeth twice a day with small, soft toothbrush and water





## 2 YEARS

### Interview Questions

- Has Ricky been weaned from the bottle?
- What kind of milk does he drink? How much?
- How much fruit juice and how many sweetened drinks (fruit punch, soft drinks) does Ricky drink? When does he drink them?
- Which foods does Ricky like to eat? Are there any foods he doesn't like?
- Does Ricky eat meals with the family?
- Does he eat the same foods as the rest of the family?
- What do you do when Ricky does not want to eat or only wants to eat a particular food?

### Screening and Assessment

- Assess child's risk for familial hyperlipidemia. (See Hyperlipidemia, pp. 60–61.)
- Screen child for iron-deficiency anemia if any risk factors are present. (See Iron-Deficiency Anemia, pp. 62–63.)
- Screen child for lead exposure. (See Lead Exposure, pp. 64–65.)
- Ask about regular dental checkups.

### Counseling

#### Discuss with Parents:

- Serving child a variety of foods to help her develop eating skills (chewing, swallowing)
- Handling child's food jags (wants to eat only a particular food) by offering smaller servings of favorite foods, along with a variety of other healthy foods
- Cleaning child's teeth twice a day with small, soft toothbrush and pea-size amount of fluoridated toothpaste
- Supervising while child brushes teeth (Children younger than 6 are at risk for enamel damage if they swallow too much fluoridated toothpaste.)

## 3 TO 4 YEARS

### Interview Questions

- What kind of milk does Felicia drink? How much?
- How much fruit juice and how many sweetened drinks (fruit punch, soft drinks) does Felicia drink? When does she drink them?
- Which foods does Felicia like to eat? Are there any foods she doesn't like?
- Does Felicia eat meals with the family?
- How often do you serve snacks? What types of foods do you serve?

### Screening and Assessment

- Assess child's risk for familial hyperlipidemia. (See Hyperlipidemia, pp. 60–61.)
- Screen child for iron-deficiency anemia if any risk factors are present. (See Iron-Deficiency Anemia, pp. 62–63.)
- Screen child for lead exposure. (See Lead Exposure, pp. 64–65.)
- Obtain child's blood pressure.
- Ask about regular dental checkups.

## Counseling

### Discuss with Parents:

- Increasing child's awareness of new foods by enjoying them as a family
- Teaching child about new foods by growing, preparing, and talking about them
- Sharing stories, drawing pictures, and singing songs about foods to help child become familiar with them
- Teaching child 3 years or older to brush teeth twice a day with small, soft toothbrush and pea-size amount of fluoridated toothpaste
- Supervising while child brushes teeth (Children younger than 6 are at risk for enamel damage if they swallow too much fluoridated toothpaste.)





## MIDDLE CHILDHOOD

### Overview

Middle childhood (ages 5 to 10) is characterized by slow, steady physical growth. However, cognitive, emotional, and social development occur at a tremendous rate.

### Growth and Development

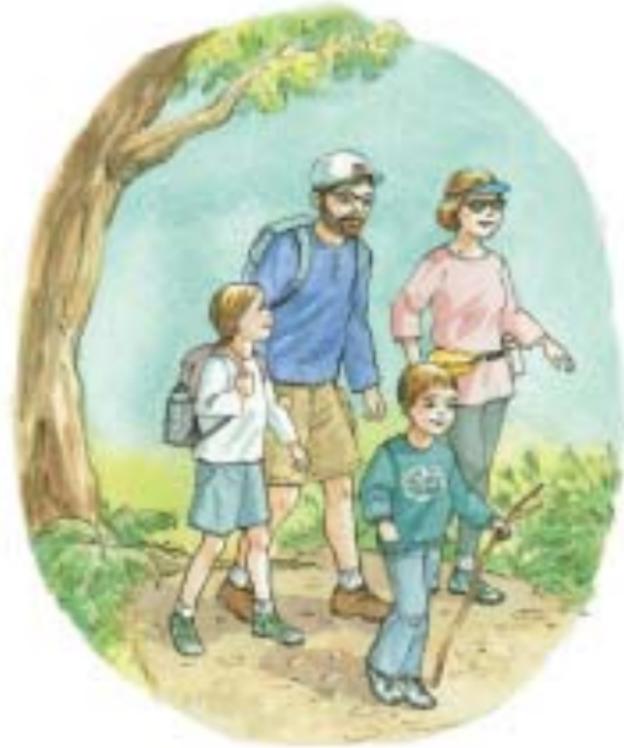
- Children gain an average of 7 pounds and grow an average of 2 1/2 inches per year.
- Head circumference increases an average of an inch per year.
- Body composition and body shape remain relatively constant.
- Growth spurts, accompanied by increased appetite and food intake, are common. Conversely, appetite and food intake decrease during periods of slower growth.

### Eating Behaviors

- Children need to consume a variety of healthy foods. They need three meals per day and snacks.
- Children can help plan and prepare meals.
- Children begin to eat more meals and snacks away from home, and their eating behaviors become influenced by peers and others outside the family.
- Parents need to help children make healthy food choices at or away from home.

## Physical Activity

- Children acquire motor skills, muscle strength, and stamina needed for complex movements, allowing them to participate in a variety of physical activities.
- The rate at which children master motor skills varies.
- Children usually acquire motor skills at a basic level through play. They need instruction and practice to fully develop these skills.
- By participating in physical activity with their children, parents emphasize the importance of physical activity—and show them that it can be fun.





## Common Nutrition Concerns

### Food Intake

- Adequate consumption of protein-rich foods (meat, beans, dairy products) is extremely important, providing children with B vitamins, iron, and zinc.
- Inadequate consumption of protein-rich foods may impair growth, increase risk of iron-deficiency anemia, and delay sexual maturation.
- Inadequate consumption of dairy products (source of calcium) may reduce peak bone mass and increase risk of osteoporosis.
- Inadequate consumption of fruits and vegetables (sources of dietary fiber, vitamins A and C, and minerals) is associated with increased risk of many types of cancer.
- Consumption of fat, saturated fat, and sodium often exceeds recommended amounts, increasing risk of cardiovascular disease, obesity, and some types of cancer.

### Body Image

- Children may become overly concerned about their physical appearance.
- Girls may be especially worried about being overweight and may begin to eat less.
- Girls need reassurance that increased body fat is part of normal growth and development and is probably not permanent.
- Boys may be concerned about their stature and muscle size and strength.
- Muscle-building activities (weightlifting) do not build muscle mass and can be harmful; muscle strength can be improved with appropriate physical activities.

### Oral Health

- Children lose primary teeth, and permanent teeth erupt.
- Children may have difficulty chewing certain foods as a result of missing teeth or orthodontic treatment and may need foods modified (crumbled, chopped) so they are easier to eat.

# NUTRITION SUPERVISION THROUGHOUT MIDDLE CHILDHOOD



A child's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. Health professionals can do the following:

- Begin nutrition supervision by asking key interview questions. Continue by using screening and assessment and counseling guidelines.
- Recognize that interview questions, screening and assessment, and counseling should be used as appropriate and will vary from visit to visit and from child to child.

## Interview Questions

### Eating Behaviors and Food Choices

#### *For the Child*

- Where did you eat yesterday? At school? At home? At a friend's house?
- 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?
- Did you drink any milk yesterday? Did you eat other dairy foods (cheese, yogurt)?

- Did you eat any fruits yesterday? Vegetables? Did you drink any juice?
- What foods do you eat most often?
- What is your favorite food?
- Are there any foods you won't eat?

#### *For the Parent*

- Do you think Tran eats healthy foods? Why (or why not)?
- What does he usually eat for snacks?
- Where does Tran eat snacks? At home? At school? At after-school care? At a friend's house?
- Do you have any concerns about his eating behaviors?

### Food Resources

#### *For the Child or Parent*

- Who usually buys 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 the way you look?
- Do you feel you are underweight? Overweight? Just right? Why?

### *For the Older Child*

- How much would you like to weigh?
- Are you trying to change your weight? If so, why? What are you doing to change it?

## Physical Activity

### *For the Child*

- Do you think you are getting enough physical activity? Why (or why not)?
- Which physical activities do you participate in? How often? For how long each time?
- How much time do you spend each day watching television and videotapes and playing computer games?

### *For the Parent*

- Do you have any questions or concerns about Renae's participation in physical activity?
- Which physical activities does Renae participate in? How often? For how long each time?

## Screening and Assessment

- Measure child's height and weight and plot on standard growth chart to determine nutrition and growth status. Deviation from expected growth pattern should be evaluated. This may be normal or may indicate a nutrition problem.
- Use body mass index (BMI) to determine nutrition status and overall health. Calculate BMI by dividing weight by square of height ( $\text{kg}/\text{m}^2$ ) or by referring to BMI chart. Compare BMI to norms listed for sex and age on chart.
- Evaluate appearance of child's skin, hair, teeth, gums, tongue, and eyes.
- Obtain child's blood pressure.
- Assess child's risk for familial hyperlipidemia. (See Hyperlipidemia, pp. 60–61.)
- Assess all sources of water used by family to determine need for fluoride supplementation. If child is not getting enough fluoride, refer to a dentist or primary care health professional.
- Ask about regular dental checkups.



## Stunting

- If height-for-age is below third percentile, evaluate to determine whether growth is stunted and whether child may benefit from improved nutrition or treatment of other underlying problems.
- Low height-for-age is usually the result of genetics, not stunting.
- Children with special health care needs may have low height-for-age because of a genetic disorder, eating problems, altered metabolic rate, malabsorption, or other conditions. Assess these factors and implement interventions to help child reach potential height.

## Thinness

- If BMI is below fifth percentile, assess for eating disorders and diseases such as cancer, diabetes mellitus, thyroid disease, infections (tuberculosis [TB], human immunodeficiency virus [HIV]), gastrointestinal disease or malabsorption, and renal disease. (See Eating Disorders, pp. 56–57.)
- Child with low BMI-for-age may be thin naturally or may have a nutritional deficit or chronic disease.

## Overweight

- If BMI is between 85th and 95th percentiles, child is at risk for overweight and needs further screening.
- If BMI is at or above 95th percentile for age and sex, child is overweight and needs in-depth medical assessment. (See Obesity, pp. 66–67.)

## Iron-Deficiency Anemia

- Screen child with history of iron-deficiency anemia, special health care needs, or low iron intake for iron-deficiency anemia. (See Iron-Deficiency Anemia, pp. 62–63.)

## Physical Activity

- Determine how much physical activity child participates in weekly.



## Counseling

Discuss with Parents and/or Child:

### *Physical Development*

- Expected accelerated growth (for girls, at ages 9 to 11; for boys, at about age 12)
- How child compares with others on standard growth chart
- Healthy body weight (determined by genetics, not social standards)
- Range of healthy body weights (People come in unique sizes and shapes.)
- Not losing weight (with possible exception of child with BMI at or above 95th percentile)
- Variation in onset of puberty among children
- Upcoming physical changes and specific concerns
- Eating healthy foods to achieve and maintain appropriate weight for height and level of physical activity

### *Eating Behaviors*

- Increasing variety of foods child eats and ways to incorporate new foods into diet
- Making healthy food choices based on Dietary Guidelines for Americans and Food Guide Pyramid

- Importance of eating healthy breakfast, lunch, dinner, and snacks
- Packing healthy foods to be eaten away from home
- Enrolling child in school breakfast and lunch programs if needed
- Energy requirements remaining fairly constant, influenced by growth, physical activity level, and body composition
- Growth spurts, increased calorie needs (200 to 300 more calories per day for active child)
- Choosing healthy snacks rich in complex carbohydrates (whole grain products, fresh fruits)
- Limiting high-fat foods (chips) and high-sugar foods (candy, soft drinks)

### *Oral Health*

- Limiting amount and frequency of foods that increase risk of dental caries
- Using community water fluoridation as safe, effective way to reduce risk of dental caries (If bottled water is preferred, recommend brand with fluoride added at a concentration of approximately 0.8 to 1.0 mg/L [ppm].)
- Providing fluoride supplementation if water is severely deficient in fluoride (less than 0.6 ppm)



### ***Physical Activity***

- Ensuring that child participates in physical activity on most, if not all, days of the week
- Incorporating physical activity into daily life (using stairs instead of elevator or escalator), participating in activities with friends and family (walking, hiking, biking)
- Results of fitness testing (Review results of President's Council on Physical Fitness and Sports test.)
- Drinking enough fluids when physically active (Children are at increased risk for heat illness because their sweat glands are not fully developed.)
- Using appropriate safety equipment (helmets, wrist guards, elbow and knee pads)
- Reducing sedentary behaviors (watching television and videotapes, playing computer games), especially if child is overweight

- Finding safe settings for physical activity
- Allowing child with special health care needs to participate in physical activity for cardiovascular fitness (within limits of medical or physical conditions)
- Adapting physical education for child with special health care needs and identifying appropriate activities by consulting physical therapist

### ***Substance Use***

- Dangers of using alcohol, tobacco, and other drugs
- Dangers of using performance-enhancing products (protein supplements, anabolic steroids)



# ADOLESCENCE

## Overview

Adolescence is a period of dramatic physical, cognitive, social, and emotional changes. It is divided into three stages:

- **Early Adolescence**—Ages 11 to 14, marked by pubertal changes and concrete thinking oriented toward the present, but a growing capacity for abstract thought
- **Middle Adolescence**—Ages 15 to 17, characterized by independence, experimentation, future-oriented thinking, and problem-solving abilities
- **Late Adolescence**—Ages 18 to 21, a time of important personal and vocational decisions and refined ability to think logically and solve problems

## Growth and Development

- Adolescents achieve final 15 to 20 percent of their adult height and gain 50 percent of their adult weight.
- Adolescents accumulate up to 40 percent of their adult skeletal mass.

- Nutrient needs are greatest during peak periods of growth (sexual maturity rating [SMR] 2 to 3 in females, 3 to 4 in males).
- Females complete most physical growth about 2 years after menarche. (Mean age of menarche is 12 1/2 years.)
- Males begin puberty about 2 years later than females.
- Males experience major growth spurts and increases in muscle mass during middle adolescence.
- Adolescents are developing an identity and becoming independent adults.

## Eating Behaviors

- Foods can have symbolic meanings. Adolescents may use foods to establish individuality and express their identity.
- Experimentation and idealism during adolescence may lead to certain eating behaviors (vegetarianism).
- Adolescents eat more meals and snacks away from home, including many fast foods high in fat and calories.
- Interest in new foods, including those from different cultures and ethnic groups, is common.



## Physical Activity

- By participating in physical activity with their adolescents, parents emphasize the importance of physical activity—and show them that it can be fun.
- Physical activity usually occurs in group settings. Adolescents' participation may be influenced by peers.
- Competitive physical activities appeal to some adolescents, but others enjoy noncompetitive activities.





## Common Nutrition Concerns

### Food Intake

- Adequate consumption of protein-rich foods (meat, beans, dairy products) is extremely important, providing adolescents with B vitamins, iron, and zinc.
- Inadequate consumption of protein-rich foods may impair growth, increase risk of iron-deficiency anemia, and delay sexual maturation.
- Consumption of certain vitamins (folate, vitamin A, vitamin B<sub>6</sub>) and minerals (iron, calcium, zinc) is often inadequate, especially among females.
- Inadequate consumption of dairy products (source of calcium) may reduce peak bone mass and increase risk of osteoporosis.
- In females of childbearing age, inadequate consumption of folic acid is associated with increased risk of giving birth to an infant with neural tube defects.
- Iron-deficiency anemia is common, especially among females whose iron requirements increase as a result of rapid growth and the onset of menarche.

- Inadequate consumption of fruits and vegetables (sources of dietary fiber, vitamins A and C, and minerals) is associated with increased risk of many types of cancer.
- Consumption of fat, saturated fat, and sodium often exceeds recommended amounts, increasing risk of cardiovascular disease, obesity, and some types of cancer.

### Body Image

- Changes associated with puberty affect adolescents' satisfaction with their appearance.
- For males, increased size and muscular development that come from physical maturation usually improve their body image.
- For females, physical maturation may lead to dissatisfaction with their bodies, which may result in weight concerns and dieting.
- Social pressure to be thin and the stigma of obesity can lead to unhealthy eating behaviors, poor body image, and eating disorders.
- Adolescents may try fad diets and other unsafe weight-loss methods, underestimating the health risks associated with them.

# NUTRITION SUPERVISION THROUGHOUT ADOLESCENCE



An adolescent's nutrition status should be evaluated during nutrition supervision visits or as part of health supervision visits. Health professionals can do the following:

- Begin nutrition supervision by asking key interview questions. Continue by using screening and assessment and counseling guidelines.
- Recognize that interview questions, screening and assessment, and counseling should be used as appropriate and will vary from visit to visit and from adolescent to adolescent.

## Interview Questions

### Eating Behaviors and Food Choices

#### *For the Adolescent*

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

- How many servings of milk did you have yesterday? Of other dairy foods?
- How many fruits did you eat yesterday? How many vegetables?
- Are there foods you won't eat? If so, which ones?
- How often do you drink soft 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 Stephanie's eating behaviors?
- Do you think Stephanie eats healthy foods?

### Food Resources

#### *For the Adolescent or Parent*

- Who usually buys the food you eat? 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?
- How much would you like to weigh?
- Are you trying to change your weight? If so, why? What are you doing to change it?

## Physical Activity

### *For the Adolescent*

- Do you think you are getting enough physical activity? Why (or why not)?
- Which physical activities do you participate in? How often? For how long each time?
- How much time do you spend each day watching television and videotapes and playing computer games?

### *For the Parent*

- Do you have any questions or concerns about Lin's participation in physical activity?
- Which physical activities does Lin participate in? How often? For how long each time?

## Screening and Assessment

- Measure adolescent's height and weight and plot on standard growth chart to determine nutrition and growth status. Deviation from expected growth pattern should be evaluated. This may be normal or may indicate a nutrition problem.
- Use body mass index (BMI) to determine nutrition status and overall health. Calculate BMI by dividing weight by square of height ( $\text{kg}/\text{m}^2$ ) or by referring to BMI chart. Compare BMI to norms listed for sex and age on chart.
- Evaluate appearance of adolescent's skin, hair, teeth, gums, tongue, and eyes.
- Obtain adolescent's blood pressure.
- Assess adolescent's risk for familial hyperlipidemia. (See Hyperlipidemia, pp. 60–61.)
- Assess all sources of water used by family to determine need for fluoride supplements. If adolescent is not getting enough fluoride, refer to a dentist or primary care health professional.
- Ask about regular dental checkups.



## Stunting

- If height-for-age is below third percentile, evaluate to determine whether growth is stunted and whether adolescent may benefit from improved nutrition or treatment of other underlying problems.
- Low height-for-age is usually the result of genetics, not stunting.

## Thinness

- If BMI is below fifth percentile, assess for eating disorders and diseases such as cancer, diabetes mellitus, thyroid disease, infections (tuberculosis [TB], human immunodeficiency virus [HIV]), gastrointestinal disease or malabsorption, and renal disease. (See Eating Disorders, pp. 56–57.)

## Overweight

- If BMI is between 85th and 95th percentiles, adolescent is at risk for overweight and needs further screening.
- If BMI is at or above 95th percentile for age and sex, adolescent is overweight and needs in-depth medical assessment. (See Obesity, pp. 66–67.)

## Iron-Deficiency Anemia

- Screen all menstruating, nonpregnant females for iron-deficiency anemia every 5 to 10 years.
- Screen females at risk for iron-deficiency anemia (those with extensive menstrual or other blood loss, low iron intake, or previous diagnosis of iron-deficiency anemia) annually.
- Screen males ages 12 to 18 with history of iron-deficiency anemia, special health care needs, or low iron intake.
- Screen adolescents 18 years and older only if risk factors are present.

## Physical Activity

- Determine how much physical activity adolescent participates in weekly.



## Counseling

Discuss with Adolescent and/or Parents:

### *Physical Development*

- How adolescent compares with others on standard growth chart
- Upcoming physical changes and specific concerns
- Healthy body weight (determined by genetics, not social standards)
- Normal physical changes (weight changes, variations in height, weight, and growth rates)
- For females, normal widening of hips and fat accumulation in hips, thighs, and buttocks (Fat accumulation ranges from 15 to 18 percent of body weight before puberty, 20 to 25 percent at end of puberty.)
- For males
  - Mild weight gain before growth spurt (at 9 to 13 years of age)
  - Decrease in percentage of body fat during growth spurt
  - Increase in percentage of body fat after puberty (by age 18, about 15 to 18 percent of body weight)

- For late-maturing males, reassurance that growth is normal (Use charts that plot height velocity by age and SMRs to ease concerns.)
- Accepting body size and shape when pubertal development is complete

### *Eating Behaviors*

- Choosing healthy foods (bread, cereal, rice, pasta; fruits and vegetables; dairy products; meat, poultry, fish, beans, eggs, nuts)
- Eating a variety of healthy foods at and away from home
- Making family meals a priority
- Importance of not skipping meals
- Energy requirements (influenced by growth, physical activity level, and body composition)
- Calories needed per day (2,500 to 3,000 for males, about 2,000 for females)
- Additional calories (600 to 1,000) needed per day if adolescent participates in vigorous physical activity

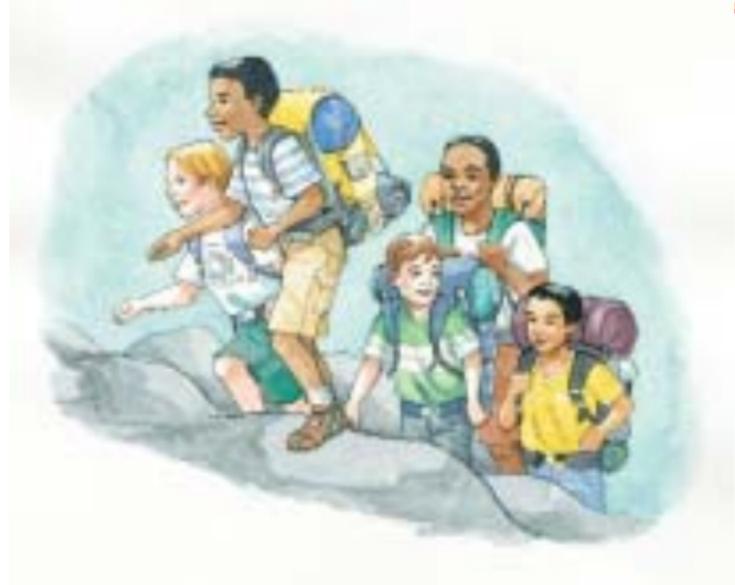


### ***Oral Health***

- Using community water fluoridation as safe, effective way to reduce risk of dental caries (If bottled water is preferred, recommend brand with fluoride added at a concentration of approximately 0.8 to 1.0 mg/L [ppm].)
- Providing fluoride supplementation if water is severely deficient in fluoride (less than 0.6 ppm)

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

- Developing positive body image
- Range of healthy body weights (People come in unique sizes and shapes.)
- Safely achieving and maintaining healthy body weight
- Assuring adolescents that they are loved and accepted as they are, regardless of their size or shape
- Avoiding unhealthy weight-loss practices





**National Center for Education  
in Maternal and Child Health**

Georgetown University

ISBN 1-57285-074-4

BF0900006



### *Physical Activity*

- Importance of participating in physical activity on most, if not all, days of the week
- Incorporating physical activity into daily life (using stairs instead of elevator or escalator), participating in activities with friends and family (walking, hiking, biking)
- Drinking enough fluids when physically active
- Using appropriate safety equipment (helmets, wrist guards, elbow and knee pads)
- Reducing sedentary behaviors (watching television and videotapes, playing computer games), especially if adolescent is overweight
- Finding safe settings for physical activity

### *Substance Use*

- Dangers of using alcohol, tobacco, and other drugs
- Dangers of using performance-enhancing products (protein supplements, anabolic steroids)

# NUTRITION ISSUES AND CONCERNS



## DIABETES MELLITUS

Diabetes mellitus is a chronic disease characterized by elevated glucose in the blood and urine. Although the exact cause of diabetes is unknown, a genetic component of the disease is recognized; environmental and immunologic factors may also play roles. There are two types of diabetes mellitus. With type 1, the body does not produce insulin, and daily injections are required. With type 2, the body continues to produce insulin, but is unable to make enough or properly use what is made.

### Prevalence

- Type 1 occurs in infants, children, and adolescents and accounts for 5 to 10 percent of all cases of diabetes mellitus.
- Type 2 has typically been diag-

nosed after age 40 and accounts for 90 to 95 percent of all cases of diabetes mellitus; however, because of the increasing prevalence of childhood obesity, the number of children and adolescents with type 2 is increasing.

### Screening

#### Type 1

- Children and adolescents should be screened for type 1 diabetes mellitus if they have polyuria, polydipsia, polyphagia, and weight loss.
- A random blood glucose level over 200 mg/dL (11.1 mmol/L) or a fasting plasma glucose level over 126 mg/dL (7.0 mmol/L) is sufficient to make a diagnosis.

#### Type 2

- Children and adolescents should be screened for type 2 diabetes

mellitus if they are overweight (BMI > 85th percentile for age and gender, weight for height > 85th percentile, or weight > 120 percent of ideal [50th percentile] for height) and have two of the following risk factors:

A history of type 2 diabetes mellitus in first- and second-degree relatives

Belonging to a certain racial/ethnic group (American Indian, African American, Hispanic American, Asian/South Pacific Islander)

Signs of insulin resistance or conditions associated with it (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome)

- Screening should be done every 2 years starting at age 10 or at the onset of puberty, whichever occurs first.

## Treatment

### Type 1

- Treatment involves careful attention to insulin administration, food intake, and physical activity to promote acceptable blood glucose and lipid levels.
- Many children and adolescents receive a mixed dose of rapid- and immediate-acting insulin twice a day, before breakfast and before the evening meal.
- Other regimens include (a) injections of rapid-acting insulin before meals and longer-acting insulin once or twice a day and (b) using an insulin pump, which delivers a small dose of rapid-acting insulin continuously, and an injection of a larger dose of insulin before meals.
- Blood glucose monitoring two to four times per day is recom-

mended to help identify blood glucose patterns and to adjust insulin and/or food intake.

### Type 2

- Treatment focuses on lowering blood glucose levels, whether by making lifestyle changes (eating healthy foods, increasing level of physical activity) or by using insulin, glucose-lowering medications, or a combination of these methods.
- Blood glucose monitoring varies from two to four times per day depending on the method.

### Counseling

- Nutrition counseling should be provided at diagnosis.
- Nutrition counseling is essential to self-management of diabetes mellitus and should be presented according to the developmental readiness of the child or adolescent.

- Children and adolescents need instruction in the daily management of diabetes mellitus.
- Older children and adolescents can share responsibility for their own care.
- Children, adolescents, and their families will need help preparing for living with diabetes mellitus.
- Families need to learn basic diabetes management skills (insulin administration, blood glucose monitoring, meal and snack planning).
- Children and adolescents need to eat meals and snacks at consistent times daily, keeping carbohydrate content consistent; identify food groups and portion sizes; and recognize and know how to treat low blood glucose levels.

For more information, see *Bright Futures in Practice: Nutrition, Diabetes Mellitus* chapter.

## EATING DISORDERS

Eating disorders range from unhealthy eating behaviors and preoccupation with body size to life-threatening disorders, such as anorexia nervosa and bulimia nervosa. Consult the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)*, published by the American Psychiatric Association, for diagnostic criteria.

### Significance

- Eating disorders occur in both sexes and in all socioeconomic and racial and ethnic groups.
- About 1 to 2 percent of female adolescents have anorexia nervosa or bulimia nervosa.
- Anorexia nervosa mortality rates vary from 5 to 8 percent to a high of 20 percent.

- Causes of death from anorexia nervosa include cardiac arrhythmia, acute cardiovascular failure, gastric hemorrhaging, and suicide.
- Major medical complications of eating disorders include the following:
  - Cardiac arrhythmia
  - Dehydration and electrolyte imbalances
  - Delayed growth and development
  - Endocrinological disturbances
  - Gastrointestinal problems
  - Oral health problems
  - Osteopenia, osteoporosis
  - Protein/calorie malnutrition

## Nutritional Inadequacies

Following are common nutritional inadequacies in children and adolescents with eating disorders:

- *Calories*—Sometimes fewer than 500 per day (a hallmark of anorexia nervosa)
- *Protein*—Resulting from inadequate consumption of protein (meat, poultry, fish, eggs, dairy products)
- *Calcium*—Resulting from inadequate consumption of calcium (dairy products, calcium-fortified foods)
- *Zinc*—Resulting from inadequate consumption of zinc and protein (milk, meat, whole grains)
- *Vitamin B<sub>12</sub>*—Resulting from inadequate consumption of dairy products or eggs

## Screening, Assessment, and Treatment

Early identification of children and adolescents with eating disorders has been linked to better long-term outcomes.

### Screening

- Conduct a physical examination.
- Measure height and weight and plot on a standard growth chart. Calculate body mass index (BMI) or refer to a BMI chart.
- Obtain a health and weight history.
- Obtain information about body image and eating and physical activity behaviors.
- Conduct a brief psychosocial assessment. If any warning signs (depression, constant thoughts about food or weight, pressure from others to be a

certain shape or size, history of physical or sexual abuse or other traumatizing life event) are present, further screening and assessment are required.

- Consult with health professionals experienced in eating disorders to help distinguish typical child or adolescent eating behaviors from eating disorders.

### Assessment and Treatment

- Comprehensive assessment and treatment require an interdisciplinary team of health professionals experienced in treating eating disorders.
- If a child or adolescent is at high risk for an eating disorder, obtain a medical history and conduct a physical, nutritional, and psychiatric/psychological assessment.

- At minimum, children and adolescents with eating disorders need to be followed long term by a physician, dietitian, and mental health professional. This team can provide medical care and monitoring, nutrition counseling, psychiatric evaluation, and individual and/or family therapy.
- Consider referral to an eating disorder treatment program if an interdisciplinary team is not available or if hospitalization is indicated.
- Consider hospitalization if the child or adolescent is severely malnourished, shows metabolic disturbances, or is at risk for suicide.

For more information, see *Bright Futures in Practice: Nutrition, Eating Disorders* chapter.

## FOOD ALLERGY

### Categories

In general, there are two categories of adverse reactions to foods. Only about 5 percent of all adverse reactions to foods and food additives are true allergies.

#### Food Allergy/Hypersensitivity

- This occurs when the immune system reacts to a particular food protein.
- Trace amounts of an allergenic food may be sufficient to trigger an adverse reaction.
- Symptoms—itching, hives, rash, vomiting, diarrhea, abdominal pain, and swelling of the lips, tongue, or face—can occur within seconds or as long as 72 hours after exposure.

#### Food Intolerance

- This is a non-immune-mediated reaction to foods or food additives.
- Reactions, which are usually dose-dependent, include (a) intolerance due to lack of an essential enzyme, and (b) reactions to food ingredients (pharmacologically active chemicals, naturally occurring pharmacologically active agents, and toxic compounds).

### Prevention/Early Intervention

- Screening high-risk families and implementing dietary and environmental measures early may greatly reduce or delay food allergies.
- The most effective way to prevent adverse food reactions and

help children tolerate food is to remove from the diet any foods that cause reactions.

### Diagnosis

Diagnosis requires a medical history, dietary history, and physical examination, and may include immunologic testing and an elimination diet and food challenge.

#### Dietary History

- Ask parents to keep a record of all foods consumed and amounts, noting adverse reactions for 5 to 7 days.
- Ask mothers of exclusively or partially breastfed infants to keep a food record and note infant's symptoms.

#### Elimination Diet

- A diet in which certain foods are eliminated is the only reliable

- way to diagnose food allergy.
- Restrict diet no more than necessary, and carefully consider the number of foods eliminated, to reduce the risk of nutritional deficiencies and feeding problems.
  - Highly restricted diets for children younger than 7 should last no longer than 10 days.
  - Duration of the elimination diet will vary from 7 to 14 days up to 4 weeks depending on severity and variability of symptoms.
  - Elimination diets need to be followed by reintroducing foods one by one (unless expected reaction is life threatening).
  - Decide which foods to eliminate based on severity of symptoms, number of potentially unsafe foods, availability of affordable alternatives, and level of commitment to the diet.

- Eliminate foods most likely to cause an adverse reaction first.
- Continue an elimination diet until child becomes symptom-free.
- Mothers of exclusively breastfed infants may have to follow an elimination diet (with appropriate supplementation) until infant shows relief from symptoms.
- A formula change may be all that is needed for an exclusively formula-fed infant.

### Food Challenges

- Challenges of eliminated foods should be performed before restricting the diet.
- If there is any chance of a severe adverse reaction, perform the food challenge with appropriate medical support.
- Never perform food challenges with potentially life-threatening foods.

- Test one food at a time.
- Start with a small portion of food, gradually increasing the portion every 4 hours until it is equivalent to a meal-size portion. If an adverse reaction occurs, no further testing of that food is required.
- Test new foods only when symptoms from previous challenges have cleared.

For more information, see *Bright Futures in Practice: Nutrition, Food Allergy* chapter.

## HYPERLIPIDEMIA

Hyperlipidemia refers to an elevation in serum levels of any or all lipids such as total cholesterol (TC), triglycerides (TG), and lipoproteins. TC, TG, high-density lipoprotein cholesterol (HDL-C), and low-density lipoprotein cholesterol (LDL-C) may need to be

measured, based on assessed risk.

Increasing evidence suggests that atherosclerosis and coronary heart disease (CHD) involve processes that begin in childhood or adolescence.<sup>1</sup> Depending on family history, children at risk for hyperlipidemia should be selectively screened beginning at age 2.<sup>2</sup>

## Screening

The table below lists major risk factors and recommended screening procedures for hyperlipidemia. Children and adolescents whose family history is unknown, particularly those with other risk factors, should be screened with a TC.<sup>2</sup>

The following risk factors are also associated with the develop-

### Hyperlipidemia Screening Recommendations Based on Family History

Major Risk Factor	Recommended Screening Procedure
<ul style="list-style-type: none"> <li>Parent or grandparent <math>\leq</math> 55 years of age diagnosed with coronary atherosclerosis (based on coronary arteriography), including those who have had balloon angioplasty or coronary artery bypass surgery</li> </ul>	<ul style="list-style-type: none"> <li>Screen with fasting lipoprotein analysis (12-hour fast)</li> <li>Repeat lipoprotein analysis and calculate the average LDL-C</li> </ul>
<ul style="list-style-type: none"> <li>Parent or grandparent <math>\leq</math> 55 years of age with documented myocardial infarction, angina pectoris, peripheral vascular disease, cerebrovascular disease, or sudden cardiac death</li> </ul>	<ul style="list-style-type: none"> <li>Screen with fasting lipoprotein analysis (12-hour fast)</li> <li>Repeat lipoprotein analysis and calculate the average LDL-C</li> </ul>
<ul style="list-style-type: none"> <li>Parent with high cholesterol level (<math>\geq</math> 240 mg/dl)</li> <li>Family history unknown</li> </ul>	<ul style="list-style-type: none"> <li>Measure TC</li> </ul>

Source: American Academy of Pediatrics.<sup>2</sup>

ment of atherosclerosis and CHD:<sup>2</sup>

- Family history of premature CHD, cerebrovascular disease, or occlusive peripheral vascular disease (< age 55 in siblings, parent, or sibling of parent)
- Cigarette smoking
- Elevated blood pressure
- Low HDL-C concentration (< 35 mg/dL)
- Severe obesity (BMI  $\geq$  95th percentile)
- Diabetes mellitus
- Physical inactivity

### Follow-Up: TC Screening

- If TC is < 170 mg/dL, rescreen within 5 years.
- If TC is between 170 and 199 mg/dL, measure TC again and calculate the average.
- If average TC is < 170 mg/dL, rescreen within 5 years.

- If average TC is  $\geq$  170 mg/dL, screen with fasting lipoprotein analysis to calculate LDL-C.
- If TC is > 200 mg/dL, screen with fasting lipoprotein analysis to determine LDL-C.

### Follow-Up: LDL-C Screening

- If average fasting LDL-C level is < 110 mg/dL, rescreen within 5 years.
- If average fasting LDL-C level is 110 to 129 mg/dL, reevaluate in 1 year.
- If average fasting LDL-C level is  $\geq$  130 mg/dL, consider referral to a dietitian or a lipid center.

*Source:* Information on screening procedures has been adapted from AAP<sup>2</sup> with permission. The assistance of Robert L. Markowitz, M.D., Children's Hospital, Boston, is gratefully acknowledged.

### References

1. Berenson GS, Srinivasan SR, Bao W, Newman III WP, Tracy RE, Wattigney WA. 1998. Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults. *New England Journal of Medicine* 338(23):1650–1656.
2. American Academy of Pediatrics, Committee on Nutrition. 1998. Cholesterol in childhood. *Pediatrics* 101(1):141–147.

For more information, see *Bright Futures in Practice: Nutrition, Hyperlipidemia* chapter.

## IRON-DEFICIENCY ANEMIA

### CDC Screening Guidelines<sup>1</sup>

#### Infants Newborn to 12 Months and Children 1 to 5 Years

Assess all infants and children ages 1 to 5 years for risk of iron-deficiency anemia. Screen those at high risk or with known risk factors using a standard laboratory test.

#### *Universal Screening for Infants and Children at High Risk*

Screen high-risk infants ages 9 to 12 months, and rescreen 6 months later (at 15 to 18 months). Screen high-risk children ages 2 to 5 annually. Include infants and children

- From families with low incomes
- Who are eligible for WIC
- Whose parents are migrants or recently arrived refugees

#### *Selective Screening for Infants and Children with Known Risk Factors*

Screen infants and children not at high risk, but who have known risk factors.

Screen preterm infants and low-birthweight infants younger than 6 months who are fed non-iron-fortified infant formula.

Screen at 9 to 12 months, and rescreen 6 months later (at 15 to 18 months), infants and children with the following risk factors:

- Infants born preterm or with low birthweight
- Infants fed non-iron-fortified infant formula for more than 2 months
- Infants fed cow's milk before 12 months of age

- Breastfed infants not receiving enough iron after 6 months of age
- Children consuming more than 24 oz of cow's milk per day after 12 months of age
- Children with special health care needs who use medications that interfere with iron absorption and those with chronic infection or inflammation, restricted diets, or extensive blood loss

Annually screen children ages 2 to 5 who

- Consume a diet low in iron
- Have limited access to food because of poverty or neglect
- Have special health care needs

### Children Ages 5 to 12 and Adolescent Males Ages 12 to 18

Screen only those with known risk factors (e.g., low iron intake, special health care needs, history of anemia).

### Adolescent Females Ages 12 to 18 and Nonpregnant Women of Childbearing Age

Annually screen those with known risk factors (e.g., excessive menstrual or other blood loss, low iron intake, a history of anemia). Screen every 5 to 10 years during routine health examinations.

### Pregnant Adolescents and Women

Screen at first prenatal care visit.

### Males Ages 18 and Older

No routine screening is recommended. Evaluate iron-deficiency anemia detected during routine health examinations.

### AAP Recommendations for Additional Screening<sup>2,3</sup>

- Screen *all* infants at 9 to 12 months, not just those at high risk or with known risk factors.
- Screen adolescent males during routine health examinations in their peak growth period.
- Screen adolescent females during all routine health examinations.

### Additional Risk Factors for Iron-Deficiency Anemia<sup>1</sup>

- Periods of rapid growth
- Low intake of meat, fish, poultry, or foods rich in ascorbic acid
- Macrobiotic diets
- Meal skipping, frequent dieting
- Pregnancy or recent pregnancy
- Participation in endurance physical activities (e.g., long-distance running, swimming, biking)
- Intensive physical training

- Recent blood loss, heavy/lengthy menstrual periods
- Chronic use of aspirin or non-steroidal anti-inflammatory drugs (e.g., ibuprofen)
- Parasitic infections

### References

1. Centers for Disease Control and Prevention. 1998. Recommendations to prevent and control iron deficiency in the United States. *MMWR* 47(No. RR-3).
2. American Academy of Pediatrics, Committee on Nutrition. 1998. *Pediatric Nutrition Handbook* (4th ed.). Elk Grove Village, IL: American Academy of Pediatrics.
3. American Academy of Pediatrics, Committee on Psychological Aspects of Child and Family Health. 1997. *Guidelines for Health Supervision III*. Elk Grove Village, IL: American Academy of Pediatrics.

For more information, see *Bright Futures in Practice: Nutrition, Iron-Deficiency Anemia* chapter.

## LEAD EXPOSURE

### CDC Screening Recommendations

The following information is based on CDC's lead screening guidance for state and local public health officials.<sup>1</sup> AAP supports the CDC guidelines for universal or targeted screening.

Based on its current preventive health care recommendations, AAP suggests that infants and children at risk should be screened for elevated blood lead levels beginning at 9 to 12 months, and rescreened at 24 months.<sup>2,3</sup>

Note that federal Medicaid policy requires that all Medicaid-eligible children be screened for elevated blood lead levels, based on the following universal screening recommendations.

### Universal Screening

Universal screening is recommended in communities in which the risk of lead exposure is widespread. A sample universal screening recommendation follows.<sup>1</sup>

#### Sample Universal Screening

Using a blood lead test, screen all children at ages 1 and 2, and all children 36–72 months of age who have not been previously screened.

### Targeted Screening

Targeted screening is recommended in communities in which the risk of lead exposure is not widespread. A sample targeted screening recommendation follows.<sup>1</sup>

#### Sample Targeted Screening

Using a blood lead test, screen children at ages 1 and 2, and all children 36–72 months of age who have not been previously screened, if they meet one of the following health department criteria:

- Child resides in a geographic area (e.g., a specified zip code) in which  $\geq 27$  percent of housing was built before 1950
- Child receives services from public assistance programs such as Medicaid or WIC
- Child's parent or guardian answers "yes" or "don't know" to any of the three questions in the basic personal-risk questionnaire

## A Basic Personal-Risk Questionnaire for Lead Exposure in Children

1. Does your child live in or regularly visit a house or child-care facility that was built before 1950?
2. Does your child live in or regularly visit a house or child-care facility built before 1978 that is being or has recently been renovated or remodeled (within the last 6 months)?
3. Does your child have a sibling or playmate who has or did have lead poisoning?

Source: Reproduced with permission from American Academy of Pediatrics,<sup>2</sup> based on CDC.<sup>1</sup> Copyright © 1998 American Academy of Pediatrics.

## History of Possible Lead Exposure

Periodically assess infants and children ages 6 months to 6 years for a history of possible lead exposure, using the basic personal-risk questionnaire and asking any additional questions recommended by the state or local health department. Screening is suggested for abused or neglected children and for children who have conditions associated with increased lead exposure.<sup>2</sup>

## References

1. Centers for Disease Control and Prevention. 1997. *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials*. Atlanta, GA: Centers for Disease Control and Prevention. Also in Centers for Disease Control and Prevention [Web site]. Cited May 14, 1999; available at <http://www.cdc.gov/nceh/programs/lead/guide/1997/guide97.htm>.
2. American Academy of Pediatrics. 1998. Screening for elevated blood lead levels [policy statement no. RE9815]. *Pediatrics* 101(6):1072–1078. Also in American Academy of Pediatrics [Web site]. Cited May 14, 1999; available at <http://www.aap.org/policy/re9815.html>.
3. American Academy of Pediatrics. 2000. *Recommendations for Preventive Pediatric Health Care* (RE9939). Available in American Academy of Pediatrics [Web site]. Cited August 7, 2000; available at <http://www.aap.org/policy/RE9939.html>.

## OBESITY

Obesity is the presence of excess adipose (fatty) tissue in the body. It is a complex chronic disease involving genetics, metabolism, and physiology, as well as environmental and psychosocial factors.

### Prevention

The most important strategies for preventing obesity are healthy eating behaviors, regular physical activity, and reduced sedentary activity. Suggestions include the following:

- Limiting duration of bottle-feeding
- Ensuring appropriate use of lower fat milk after 2 years of age
- Limiting consumption of high-sugar foods

- Being aware of portion sizes
- Limiting frequency of fast-food meals
- Encouraging family members to drink water
- Physical activity is recommended on most, if not all, days of the week.

These strategies are part of a healthy lifestyle that should be developed during early childhood.

### Screening

- Calculate child's or adolescent's body mass index (BMI) by dividing weight by the square of height ( $\text{kg}/\text{m}^2$ ) or by referring to a BMI chart. BMI reflects body mass and the amount of subcutaneous and total body fat.
- Elevated triceps skinfold (above 95th percentile) can confirm excess body fat.

### For Children Older than 2

- A BMI at or above 95th percentile indicates overweight, requiring in-depth assessment of child or adolescent.
- A BMI between 85th and 95th percentiles indicate risk for becoming overweight. A child or adolescent with such a BMI should be screened and assessed carefully, with particular attention paid to family history and secondary complications of obesity (hypertension, dyslipidemia).
- A child or adolescent with an annual increase of 3 to 4 BMI units should be evaluated.

## Assessment

Conduct an in-depth assessment to identify children and adolescents who are obese, diagnose any underlying causes, and provide a basis for treatment.

### Medical History

Identify underlying syndromes or secondary complications.

### Family History

Identify familial risks for obesity (presence of obesity, eating disorders, type 2 diabetes mellitus, cardiovascular disease, hypertension, dyslipidemia, gallbladder disease in siblings, parents, aunts, uncles, or grandparents).

### Dietary History

Identify eating behaviors that may lead to excessive caloric intake.

### Physical Activity History

Identify activity levels and determine time spent in sedentary behaviors. Note history of medical contraindications (asthma, joint disease) to physical activity.

### Physical Examination

Determine the degree of overweight (by plotting height, weight, and BMI on a standard growth chart) and potential underlying syndromes or complications of obesity.

### Laboratory Testing

Choose laboratory tests based on degree of overweight, family history, and physical examination.

### Psychological Evaluation

Evaluate child's, adolescent's, and family's readiness to change by asking whether the family is concerned about their child's or

adolescent's weight, whether they believe weight loss is possible, and what behaviors should be changed.

## Treatment

- The primary goal of treatment is to achieve healthy eating and physical activity behaviors and psychological well-being, rather than obtaining ideal body weight.
- A secondary goal of treatment is to achieve a BMI at or below 85th percentile.
- Treatment should emphasize skills needed to change behaviors and maintain changes.
- Weight maintenance is the first step toward weight control.
- Weight loss, if warranted, should be about 1 pound per month.

## Referral

- Refer child or adolescent with an eating disorder to an eating disorder program that incorporates psychological assessment/treatment, medical assessment/treatment, and nutrition counseling.
- Refer child or adolescent with depression for psychological evaluation and treatment.
- Children and adolescents with serious complications of obesity (pseudotumor cerebri, sleep apnea, obesity hypoventilation syndrome, Blount's disease [tibia vara], slipped capital femoral epiphysis, severe overweight [above 99th percentile]) need to be closely monitored and referred to an obesity treatment program.

For more information, see *Bright Futures in Practice: Nutrition, Obesity* chapter.

# NUTRITION TOOLS



## KEY INDICATORS OF NUTRITION RISK

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Food Choices</b>		
<p>Consumes fewer than 2 servings of fruit or fruit juice per day.</p> <p>Consumes fewer than 3 servings of vegetables per day.</p>	<p>Fruits and vegetables provide dietary fiber, vitamins (such as A and C), and minerals. Low intake of fruits and vegetables is associated with an increased risk of many types of cancer. In females of childbearing age, low intake of folic acid is associated with increased risk of giving birth to an infant with neural tube defects.</p>	<p>Assess the child/adolescent who is consuming less than 1 serving of fruit or fruit juice per day.</p> <p>Assess the child/adolescent who is consuming fewer than 2 servings of vegetables per day.</p>
<p>Consumes fewer than 6 servings of bread, cereal, rice, pasta, or other grains per day.</p>	<p>Grain products provide complex carbohydrates, dietary fiber, vitamins, and minerals. Low intake of dietary fiber is associated with constipation and increased risk of colon cancer.</p>	<p>Assess the child/adolescent who is consuming fewer than 3 servings of bread, cereal, pasta, rice, or other grains per day.</p> <p>Assess the child/adolescent who has recent history of constipation.</p>

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Food Choices (cont.)</b>		
<p>For children younger than 9 years, consumes fewer than 2 servings of dairy products per day.</p> <p>For children 9 years and older and adolescents, consumes fewer than 3 servings of dairy products per day.</p>	<p>Dairy products are a good source of protein, vitamins, and calcium and other minerals. Low intake of dairy products may reduce peak bone mass and increase the risk of osteoporosis.</p>	<p>Assess the child (younger than 9 years) who is consuming less than 1 serving of dairy products per day.</p> <p>Assess the child (9 years and older) or adolescent who is consuming fewer than 2 servings of dairy products per day.</p> <p>Assess the child/adolescent who has a milk allergy or is lactose intolerant.</p> <p>Assess the child/adolescent who is consuming more than 2 soft drinks per day.</p>

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Food Choices (cont.)</b>		
Consumes fewer than 2 servings of meat or meat alternatives (e.g., beans, eggs, nuts, seeds) per day.	Protein-rich foods (e.g., meats, beans, dairy products) are good sources of B vitamins, iron, and zinc. Low intake of protein-rich foods may impair growth and increase the risk of iron-deficiency anemia and of delayed growth and sexual maturation. Low intake of meat or meat alternatives may indicate inadequate availability of these foods at home. Special attention should be paid to children and adolescents who follow a vegetarian diet.	Assess the child/adolescent who is consuming less than 1 serving of meat or meat alternatives per day.
For children 5 years and older, has excessive intake of dietary fat.	Excessive intake of dietary fat contributes to the risk of cardiovascular disease and obesity and is associated with some cancers.	Assess the child/adolescent who has a family history of premature cardiovascular disease.  Assess the child/adolescent who has a body mass index (BMI) greater than or equal to the 85th percentile.

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Eating Behaviors</b>		
Exhibits poor appetite.	A poor appetite may be developmentally appropriate for young children, but in older children it may indicate depression or other emotional stress or chronic disease.	<p>Assess the child/adolescent if BMI is less than the 15th percentile or if weight loss has occurred.</p> <p>Assess if irregular menses or amenorrhea has occurred for 3 months or more.</p> <p>Assess for organic and psychiatric disease.</p>
Consumes food from fast-food restaurants 3 or more times per week.	Excessive consumption of convenience foods and foods from fast-food restaurants is associated with high fat, calorie, and sodium intake, as well as low intake of certain vitamins and minerals.	Assess the child/adolescent who is overweight/obese or who has diabetes mellitus, hyperlipidemia, or other conditions requiring reduction in dietary fat.

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Eating Behaviors (cont.)</b>		
Skips breakfast, lunch, or dinner/ supper 3 or more times per week.	Meal skipping is associated with a low intake of energy and essential nutrients and, if it is a regular practice, could compromise growth and sexual development. Repeatedly skipping meals decreases the nutritional adequacy of the diet.	Assess the child/adolescent to ensure that meal skipping is not due to inadequate food resources or unhealthy weight-loss practices.
Has food jags—eats one particular food only.	Food jags, which limit the variety of food consumed, decrease the nutritional adequacy of the diet.	Assess the child's/adolescent's dietary intake over several days.
<b>Food Resources</b>		
Has inadequate financial resources to buy food, insufficient access to food, or lack of access to cooking facilities.	Poverty can result in hunger and compromised food quality and nutrition status. Inadequate dietary intake interferes with learning.	Assess the child/adolescent who is from a family with low income, is homeless, or is a runaway.

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Weight and Body Image</b>		
<p>Practices unhealthy behaviors (e.g., chronic dieting, vomiting, and using laxatives, diuretics, or diet pills to lose weight).</p>	<p>Chronic dieting is associated with many health concerns (e.g., fatigue, impaired growth and sexual maturation, irritability, poor concentration, impulse to binge) and can lead to eating disorders. Frequent dieting in combination with purging is associated with health-compromising behaviors (e.g., substance use, suicidal behaviors). Purging is associated with serious medical complications.</p>	<p>Assess the child/adolescent for eating disorders.</p> <p>Assess for organic and psychiatric disease.</p>
<p>Is excessively concerned about body size or shape.</p>	<p>Eating disorders are associated with significant health and psychosocial morbidity. Eighty-five percent of all cases of eating disorders begin during adolescence. The earlier adolescents are treated, the better their long-term prognosis.</p>	<p>Assess the child/adolescent for distorted body image and dysfunctional eating behaviors, especially if child/adolescent wants to lose weight but BMI is less than the 85th percentile.</p>

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Weight and Body Image (cont.)</b>		
Exhibits significant weight change in past 6 months.	Significant weight change during the past 6 months may indicate stress, depression, organic disease, or an eating disorder.	Assess the child/adolescent to determine the cause of weight loss or weight gain (e.g., limited or too much access to food, poor appetite, meal skipping, eating disorder).
<b>Growth</b>		
Has BMI less than the 5th percentile.	Thinness may indicate an eating disorder or poor nutrition.	<p>Assess the child/adolescent for eating disorders.</p> <p>Assess for organic or psychiatric disease.</p> <p>Assess for inadequate food resources.</p>
Has BMI greater than the 95th percentile.	Obesity is associated with elevated cholesterol levels and elevated blood pressure. Obesity is an independent risk factor for cardiovascular disease and type 2 diabetes mellitus in adults. Overweight children and adolescents are more likely to be overweight adults and are at increased risk for health problems as adults.	Assess the child/adolescent who is overweight or at risk for becoming overweight (e.g., on the basis of present weight, weight gain patterns, family weight history).

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Physical Activity</b>		
<p>Is physically inactive: participates in physical activity fewer than 5 days per week.</p>	<p>Lack of physical activity is associated with overweight, fatigue, and poor muscle tone in the short term, and a greater risk of cardiovascular disease in the long term. Regular physical activity reduces the risk of cardiovascular disease, hypertension, colon cancer, and type 2 diabetes mellitus. Weight-bearing physical activity (e.g., walking, hiking) is essential for normal skeletal development during childhood. Regular physical activity is necessary for maintaining normal muscle strength, joint structure, and joint function; contributes to psychological health and well-being; and facilitates weight reduction and weight maintenance throughout life.</p>	<p>Assess how much time the child/adolescent spends watching television/videotapes and playing computer games.</p> <p>Assess the child's/adolescent's definition of physical activity.</p>

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Physical Activity (cont.)</b>		
Participates in excessive physical activity.	Intense physical activity nearly every day, sometimes more than once a day, can be unhealthy and associated with menstrual irregularity, excessive weight loss, and malnutrition.	Assess the child/adolescent for eating disorders.
<b>Medical Conditions</b>		
Has chronic diseases or conditions.	Medical conditions (e.g., diabetes mellitus, spina bifida, renal disease, hypertension, pregnancy, HIV infection/AIDS) have significant nutritional implications.	Assess child's/adolescent's compliance with therapeutic dietary recommendations.  Refer to dietitian if appropriate.
Has hyperlipidemia.	Hyperlipidemia is a major cause of atherosclerosis and cardiovascular disease in adults.	Refer child/adolescent to a dietitian for cardiovascular nutrition assessment.

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Medical Conditions (cont.)</b>		
<p>Has iron-deficiency anemia.</p>	<p>Iron deficiency causes developmental delays and behavioral disturbances. Another consequence is increased lead absorption. Childhood lead poisoning causes neurological and developmental deficits.</p>	<p>Screen children whose families have low incomes, are migrant, or are recently arrived refugees.</p> <p>Screen male children/adolescents who have low iron intake, a history of iron-deficiency anemia, limited access to food because of poverty or neglect, or special health care needs.</p> <p>Screen nonpregnant adolescents every 5 to 10 years or annually if they have a history of iron-deficiency anemia, low iron intake, or extensive menstrual or other blood loss.</p>

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Medical Conditions (cont.)</b>		
Has dental caries.	Food affects the health of the mouth as well as overall health. Calcium and vitamin D are vital for strong bones and teeth, and vitamin C is necessary for healthy gums. Eating habits have a direct impact on oral health. Frequent consumption of carbohydrate-rich foods (e.g., lollipops, soda) that stay in the mouth longer may cause dental caries. Fluoride in water used for drinking and cooking as well as in toothpaste reduces the prevalence of dental caries.	<p>Assess the child's/adolescent's consumption of snacks and beverages that contain sugar, and assess snacking patterns.</p> <p>Assess the child's/adolescent's access to fluoride (e.g., fluoridated water, fluoride tablets).</p>
Is pregnant.	Pregnancy increases the need for most nutrients.	Refer the adolescent to a dietitian for further assessment, education, and counseling as appropriate.
Is taking prescription medication.	Many medications interact with nutrients and can compromise nutrition status.	Assess potential interactions of prescription drugs (e.g., asthma medications, antibiotics) with nutrients.

Indicators of Nutrition Risk	Relevance	Criteria for Further Screening and Assessment
<b>Lifestyle</b>		
Engages in heavy alcohol, tobacco, and other drug use.	Alcohol, tobacco, and other drug use can adversely affect nutrient intake and nutrition status.	Assess the child/adolescent further for alcohol, tobacco, and other drug use.
Uses dietary supplements.	Dietary supplements (e.g., vitamin and mineral preparations) can be healthy additions to a diet, especially for pregnant and lactating women and for people with a history of iron-deficiency anemia; however, frequent use or high doses can have serious side effects. Adolescents who use supplements to “bulk up” may be tempted to experiment with anabolic steroids.	Assess the child/adolescent for the type of supplements used and dosages.  Assess the adolescent for use of anabolic steroids and megadoses of other supplements.

## TIPS FOR PROMOTING PHYSICAL ACTIVITY

### General

- Encourage children and adolescents to participate in physical activity on most, if not all, days of the week.
- Provide opportunities for physical activity.
- Make physical activity enjoyable.
- Support children's and adolescent's physical activity efforts.
- Encourage children and adolescents to participate in physical activities they can continue throughout life.
- Help children and adolescents succeed and increase their confidence in physical activity.
- Teach children and adolescents about the benefits of physical activity and help them develop positive attitudes toward it.

- Adapt activities to children and adolescents with special health care needs.
- Help children and adolescents overcome physical activity barriers.

### At Home

#### For Children and Adolescents

- Help with household chores to incorporate physical activity into daily life (walk the dog, vacuum, mow the lawn, rake the leaves).

#### For Parents

- Schedule time for physical activity.
- Take turns selecting physical activities family members and friends can do together.
- Participate in physical activity with your children and adolescents.

- Provide toys, games, and equipment that promote physical activity.
- Teach children to play safely (not playing in the street).
- Provide appropriate safety equipment (helmet, wrist guards, elbow and knee pads) and ensure that children and adolescents use it during physical activity.
- Ensure that children and adolescents use sunscreen to reduce their exposure to sunlight.
- Ensure that children and adolescents drink enough water before, during, and after physical activity.
- Limit the time your children and adolescents spend watching TV and videotapes and playing computer games to 1 to 2 hours a day.

## In the Community

### For School Personnel and Community Program Staff

- Offer physical education in school.
- Offer physical activity programs during nonschool hours (after school, on weekends, during the summer).
- Provide older children and adolescents with a mix of competitive and noncompetitive physical activities.
- Set goals for increasing physical activity levels and keep track of progress.
- Provide programs that teach families about physical and motor skill development.
- Provide appropriate safety equipment and ensure that children and adolescents use it during physical activity.

- Provide enough water for children and adolescents before, during, and after physical activity.
- Make physical activity programs accessible to children and adolescents from families with low incomes by providing transportation and appropriate equipment.
- Maintain policies (preservation of green space) and provide environmental support to promote physical activity.
- Provide safe environments for indoor and outdoor physical activity (biking paths, playgrounds, parks).

### For Parents

- Advocate for physical education in school.
- Help with physical activity programs at your child's or adolescent's school.

- Encourage schools to offer opportunities for physical activity during nonschool hours.
- Adopt a highway, park, or beach, and keep it clean.
- Organize family outings that include physical activity.
- Identify safe places for children and adolescents to participate in physical activity.
- Identify activities and places for participating in physical activity (basketball and tennis courts, community swimming pools) at no or reduced cost.
- Work with the community to ensure that children and adolescents from families with low incomes have transportation to and from physical activity programs, and appropriate safety equipment.

## TIPS FOR PROMOTING FOOD SAFETY

### Keep Everything Clean

- Wash hands before preparing or eating food and after doing anything that interrupts either activity.
- Wash fresh fruits and vegetables carefully before cooking them or eating them raw.
- Wash dishes in a dishwasher or in hot soapy water using a clean dishcloth. Don't use sponges—they often spread germs. Rinse and sanitize dishes and let them air dry.
- Wash cutting boards thoroughly with hot soapy water between uses for different foods, especially after using them to cut raw meat. Only use cutting boards made of nonporous materials.

### Prepare Foods Properly

- Cook foods thoroughly, especially foods containing meat, poultry, fish, or eggs. Cook hamburger until it is brown or gray on the inside. Cook chicken until juices are clear when a knife or fork is stuck into it. Cook fish until it is opaque and flakes easily with a fork. Cook eggs until they are firm.
- Thaw frozen foods in the refrigerator or under cold running water—never on the counter or in a bowl of standing water.
- When serving foods, make sure hot foods stay above 140°F and cold foods stay below 40°F.

### Store Foods Safely

- Serve cooked foods stored in the refrigerator within 24 hours.
- Store raw foods underneath cooked and ready-to-eat foods in the refrigerator.
- Store dry ingredients (rice, sugar) in nonporous containers with tight-fitting lids.
- Cover and refrigerate or freeze cooked foods if they will not be eaten right away.
- Leftovers that are refrigerated or frozen should be reheated one time only.
- Reheat liquids (gravy, soup, sauce) by bringing them to a boil. Reheat solid foods at 165°F.
- Store cleaning products and medications away from food and out of children's reach.



**National Center for Education  
in Maternal and Child Health**

Georgetown University

ISBN 1-57285-074-4

BF0900006