

Pediatric Nutrition: Practical Perspectives

Pediatric Obesity: An Increasing Problem



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PEDIATRIC OBESITY: AN INCREASING PROBLEM

NEEDS ASSESSMENT

The problem of childhood obesity has received much attention in recent years from healthcare practitioners, the general public, and even the White House—and many local and national initiatives are addressing this problem.¹ Yet equal attention has not been given to the increasing evidence that obesity from childhood into adulthood can largely be averted by infant feeding and family lifestyle choices. Pediatric practitioners can help prevent childhood overweight and obesity by recognizing infants at risk and taking opportunities to educate parents about how to protect their child from becoming overweight. These approaches include breastfeeding, introducing solid foods in a timely manner, and various strategies to establish good eating habits early in life. Given that interventions to combat established overweight generally are only marginally effective and improvements often are not maintained over the long term, it is particularly important for pediatricians to recommend preventive strategies and help parents implement them.^{2,3}

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LEARNING OBJECTIVES

Upon completion of this educational activity, participants should be better able to:

- Cite the prevalence and impact of overweight/obesity in pediatric patients
- Explain the relationship between infants' and young children's feeding choices and risk for overweight/obesity in later life
- Describe current infant feeding practices, citing findings of the 2008 Feeding Infants and Toddlers Study (FITS)
- Review possible options for preventing pediatric overweight/obesity
- Describe strategies to improve clinical practice and parent education about infant and young children feeding practices

INTENDED AUDIENCE

Pediatricians, nurses, pediatric nurse practitioners, registered dietitians, and other healthcare professionals involved in the care of children

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Alan M. Lake, MD, has served as a consultant for Nestlé Nutrition Institute/Gerber.

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Pediatric Obesity: An Increasing Problem

Alan M. Lake, MD

The problem of childhood obesity has received much attention in recent years from healthcare practitioners, the general public, and even the White House—and many local and national initiatives are addressing this problem.¹ Yet equal attention has not been given to the increasing evidence that obesity from childhood into adulthood can largely be averted by infant feeding and family lifestyle choices. Pediatric practitioners can help prevent childhood overweight and obesity by recognizing infants at risk and taking opportunities to educate parents about how to protect their child from becoming overweight. These approaches include breastfeeding, introducing solid foods in a timely manner, and various strategies to establish good eating habits early in life. In addition, mandating and implementing strong nutritional standards for food and beverages available in government-run or -regulated after-school programs, recreation centers, parks, and child-care facilities—including limiting access to unhealthy foods and beverages—will help to establish good eating habits.² Given that interventions to combat established overweight generally are only marginally effective and improvements often are not maintained over the long term, is particularly important for pediatricians to recommend preventive strategies and help parents implement them.^{3,4}



THE SCOPE OF THE PROBLEM

The prevalence of overweight among US children increased dramatically from the 1970s until 1999.^{5,6} From 1999 to 2008, the overweight/obesity rate, although high, was stable overall among children and adolescents from 2 through 19 years of age: 31.7% were at or above the 85th percentile of the body mass index (BMI)-for-age growth charts; 11.9% of youngsters in this age group were at or above the 97th percentile.⁷ In 2007 through 2008, 9.5% of infants and toddlers were at or above the 95th percentile of the weight-for-recumbent-length growth charts. A 2005 study in about 8,550 four-year-olds showed particularly high rates of obesity (BMI \geq 95th

percentile) among native Americans (31.2%), Hispanics (22%), and non-Hispanic blacks (20.8%).⁸

The high rate of overweight/obesity in infants and toddlers is especially alarming. Overweight/obesity tends to be persistent during the preschool and elementary school years and into adulthood, thereby increasing the risk of early development of diabetes, hypertension, and cardiovascular disease. An analysis of data from more than 1,000 US children in 10 locations showed that children who had been overweight (above the 85th percentile for BMI) at ages 24, 36, or 54 months were more than five times as likely to be overweight at 12 years of age than children whose BMIs were below this

A systematic review of 61 studies found that compared with formula feeding, breastfeeding was associated with reduced risk for obesity in infancy, childhood, or adulthood.

percentile at all three of these ages.⁹ Furthermore, 60% of children who were overweight at any time during the preschool period and 80% of youngsters who were overweight at any time during the elementary school period were overweight by the age of 12 (children were evaluated at 7, 9, and 11 years of age). In contrast, no children who were below the 50th percentile for BMI at all time points during elementary school were overweight by the time they were 12 years old.⁹ One study showed that children who are overweight or obese at 10 years of age have an 80% risk for obesity as an adult versus a 10% risk in their non-obese peers.¹⁰

RISK/PROTECTIVE FACTORS FOR CHILDHOOD OBESITY

Risk factors for childhood overweight/obesity do not relate solely to feeding practices. Investigators have identified other early-life determinants of overweight as well as protective factors.

Pregnancy/neonatal risk factors. Both maternal obesity and excess gestational weight gain put offspring at increased risk for future obesity.¹¹ A study in pregnant sheep suggested that early programming of obesity in offspring may result from “two hits”: maternal over-nutrition during the periconceptional period and increased fetal nutrition in late pregnancy.¹² A systematic review of 35 studies found strong evidence that excessive gestational weight gain increases the risk of delivering a large-for-gestational-age infant.¹³ This higher birth weight makes it more likely that the infant will be obese later in life.^{13,14}

Low birth weight also is associated with adult obesity. When fetal malnutri-

tion leads to a smaller-than-normal baby, the risk increases for physiologic disturbances in adulthood, including early diabetes and cardiovascular disease. This intriguing phenomenon, called the Barker hypothesis,¹⁵ suggests that the relationship between birth weight and metabolic abnormalities later in life is depicted by a U-shaped curve, with more obesity seen in both the lowest- and highest-weight babies (mean normal birth weight 7 lb, 8 oz). Alterations in fetal nutrition and fetal endocrine status seem to result in permanent developmental adaptations in structure, physiology, and metabolism. These adaptations predispose both the low- and high-weight fetus to cardiovascular, metabolic, and endocrine disease in later life. This interaction of intrauterine nutrition with genetic predisposition—called “nutrigenomics”—is believed to prime the fetus toward extrauterine concerns.

Gestational diabetes mellitus is linked with childhood obesity as well, as seen in a nationwide survey of children 9 to 14 years of age.¹⁴ Of those whose mothers had gestational diabetes mellitus, 17.1% were at risk for overweight and obesity and 9.7% were overweight and obese in early adolescence, versus 14.2% and 6.6%, respectively, of those whose mothers did not have gestational diabetes mellitus.¹⁴

Maternal smoking and rapid infant growth are also associated with subsequent overweight and obesity.¹⁶ In a systematic review of 24 studies that assessed the association between infant size or growth and subsequent obesity, infants who were at the highest end of the distribution for weight or BMI or

who grew most rapidly during infancy were at increased risk for later obesity; this association was consistent at different ages.¹⁷ Another examination in about 560 infants found that rapid increases in weight-for-length during the first 6 months of life were related to a much-increased risk of obesity at 3 years of age.¹⁸

Breastfeeding. Several systematic reviews and meta-analyses have shown that breastfeeding protects against obesity later in life. One meta-analysis of nine studies with more than 69,000 participants showed that breastfeeding had a small but consistent protective effect against obesity in children (adjusted odds ratio, 0.78). This effect held even after adjustment for confounding factors such as birth weight, parental overweight, parental smoking, dietary factors, physical activity, and socioeconomic status. Age at last follow-up in these nine studies ranged from 3 to 26 years.¹⁹

Recent government publications, including *The Surgeon General's Call to Action to Support Breastfeeding 2011*, First Lady Michelle Obama's “Let's Move” campaign,²⁰ and the White House Task Force on Childhood Obesity, have reiterated the message that infants breastfed for at least 6 months are less likely to become obese than other children.^{19,21,22}

A systematic review of 61 studies found that compared with formula feeding, breastfeeding was associated with reduced risk for obesity in infancy, childhood, or adulthood (odds ratio, 0.87). This inverse relationship was strongest in studies of fewer than 500 participants but held in larger studies as well. Adjustment for the confounding factors of parental obesity, maternal smoking, and social class markedly reduced the inverse association between breastfeeding and obesity, however.²³

Some investigators also have observed that longer duration of breastfeeding is associated with greater protective

effects. A survey of more than 15,000 youngsters aged 9 to 14 years and their mothers, for example, showed that adolescents who were breastfed for at least 7 months were about 20% less likely to be overweight/obese than their peers who were breastfed for no longer than 3 months.²⁴ And a survey involving more than 9,000 children aged 5 to 6 years in Germany found a clear dose-response effect between duration of breastfeeding and prevalence of obesity: Two months of exclusive breastfeeding was associated with an obesity prevalence of 3.8%, 3 to 5 months with 2.3%, 6 to 12 months with 1.7%, and more than 12 months with 0.8%. Similar associations were seen with the prevalence of overweight.²⁵

Timing of supplemental food

Introduction. Four months is the youngest age recommended by the American Academy of Pediatrics (AAP) for the introduction of solid foods.¹ Some studies suggest that the introduction of solid foods earlier than 4 months of age is associated with increased weight in childhood, while others have shown no relationship between the timing of solid food introduction and weight.²⁶

A recent study of this issue showed a definite association between early introduction of solid food and obesity in certain infants. Introduction of solid foods before 4 months of age was associated with a six-fold increase in the odds of obesity at 3 years of age—but only among formula-fed infants. In breastfed infants, the timing of solid food introduction did not influence the odds of obesity. In addition, mothers of formula-fed infants were more likely than mothers of breastfed infants to introduce solid foods before their offspring were 4 months old. The study group involved almost 850 infants; 7% of those who were breastfed were obese at 3 years of age compared with 13% of formula-fed infants.²⁶

Other risk factors for overweight/obesity. A study in more than 8,200

seven-year-olds in Britain identified factors in early life that are associated with an increased risk for obesity in childhood. In addition to parental obesity and various aspects of early adiposity and rapid growth, certain lifestyle factors were associated with obesity at age 7: namely, at 3 years of age, watching television more than 8 hours per week and sleeping fewer than 10.5 hours per night.²⁷ Obesity seems to be prevented by exposure to three household routines:

- Getting at least 10.5 hours of sleep a night on weeknights
- Participating in TV viewing no more than 2 hours a day on weekdays
- Eating the evening meal as a family more than 5 nights a week.

An assessment of about 8,550 four-year-olds showed that children exposed to these three routines had about a 40% lower prevalence of obesity than youngsters who were exposed to none of them.²⁸

Other environmental factors that are within parental control can lead to overweight/obesity. For example, the stringent restriction by well-meaning parents of their child's consumption of "bad" (high-fat, energy-dense) foods can actually enhance the child's liking of these foods and promote their consumption. Conversely, parental encouragement to eat a particular food seems to increase the child's dislike for that food. Both of these practices—pushing a child to eat fruits and vegetables, for example, or banning cookies and chips—can lead to overconsumption of high-fat, high-energy foods and, therefore, more calories than needed as well as excess weight (see sidebar, "My child isn't fat!").²⁹

HOW DO INFANT/TODDLER DIETS NEED TO BE IMPROVED?

To foster healthy eating habits in their youngest patients and advise their parents, pediatric practitioners need an



understanding of what infants and toddlers are actually eating. Findings from the 2008 Feeding Infants and Toddlers Study (FITS) provide this information based on telephone interviews and 24-hour dietary recalls of caregivers of more than 3,000 youngsters 4 to 24 months of age.³⁰ A comparison of results of this survey with a similar FITS conducted in 2002 shows some positive changes in feeding practices as well as areas that need improvement.

Positive findings. FITS showed that mothers were breastfeeding longer in 2008 than they were in 2002. In 2008, 49% of infants and toddlers were breastfeeding at 6 months of age and 24% were still breastfeeding at 12 months, as recommended by the AAP.^{30,31} Although the rate of infants ever breastfed was similar in 2008 and 2002 (79.5% and 76.2%, respectively), in 2008 that rate was significantly higher for infants 4 to 5.9 months of age (42.5%) than in 2002 (26.2%). For infants 6 to 8.9 months old, the rates were 37.3% in 2008 compared with 26.9% in 2002, and for infants 9 to 11.9 months old, the rates were 36.7% vs 20.9%. Breastfeeding rates during the second year of life were similar in 2008 and 2002: 7.4% and 7.1%, respectively.³⁰ The longer duration of breastfeeding was accompanied by a desirable delay in the introduction of complementary

CASE STUDY

My child isn't fat!

Mrs. H and her mother arrive at the office with Cathy for the child's 3-year physical examination. A term newborn, breastfed for the first 6 months, Cathy has been at the 60th percentile for both weight and height since her first birthday. She is the first child for this family, and both parents are somewhat overweight. But today, Cathy's weight is above the 95th percentile, while her height remains at the 60th percentile. Her mother and grandmother say they are pleased that she is "healthy and plump like all the women in our family—the way we like them."

When the pediatrician shows the family the growth curve indicating that Cathy's body mass index (BMI) has jumped above the 85th-percentile cutoff for overweight, they express no great concern. They clearly see no reason to make any change in how they feed Cathy, so taking the time to educate the extended family will probably be the initial course of action for improving Cathy's future wellness.

Questioning reveals that Mrs. H considers Cathy to be a picky eater because she eats mostly pasta and breads, along with other carbohydrates. She does eat some fruits, although not every day, no vegetables other than potato, and only one form of chicken nuggets. The family encourages Cathy to clean her plate and even to take second helpings of foods she prefers. The family eats take-out most nights of the week because the parents "are too tired to cook." Her parents describe Cathy as active "but too young for any regular exercise," and they explain that her daycare center is in a

city and offers minimal outdoor play because of safety concerns.

Further questioning reveals that Cathy's grandmother has type 2 diabetes, hypertension, and elevated lipids—conditions that she realizes are related to the child's obesity. This understanding opens the door to motivating the family to make some changes in how Cathy is fed. Together, the pediatrician and the family come up with a plan for eating more homemade meals (cooking ahead on weekends) and providing Cathy with more exercise. The pediatrician also encourages Mrs. H to let Cathy regulate her own food intake instead of cleaning her plate and to continue to offer Cathy a variety of foods, even if she rejects them repeatedly. To reinforce these messages, the pediatrician provides Mrs. H with some handouts.

Mrs. H is asked to follow up with any questions or problems and to visit again in 3 and 6 months. At the 6-month follow-up visit, both Mrs. H and the pediatrician are pleased to find that Cathy's BMI has dropped to below the 80th percentile. Seeing this improvement, Mrs. H wants to continue the new regimen and asks the pediatrician for further suggestions to help her daughter achieve and maintain a healthy weight.



foods, with more infants being given solids by no earlier than 4 months of age, as the AAP recommends.^{30,31}

Fewer children and infants are consuming desserts, sweets, sweetened beverages, and salty snacks in 2008 than they were in 2002. This trend was reflected in less consumption of baby food desserts in three age groups: 6- to 8.9-month-olds, 12- to 14.9-month-olds, and 15- to 17.9-month-olds. Compared with 2002, in 2008 infants 6 to 11 months of age and toddlers 18 to 23.9 months consumed fewer cakes, pies, and cookies, and children 6 to 11.9 months and 15 to 17.9 months ate less candy. The proportion of toddlers drinking sweetened beverages also dropped significantly among 12- to 14.9-

month-olds and 18- to 20.9-month-olds. The same positive trend was seen with regard to salty snacks, consumption of which declined from 2002 to 2008 among infants 6 to 11.9 months of age.³⁰

Nonetheless, the proportion of youngsters who consumed some type of dessert, sweet or sweetened beverage, candy, or salty snack at least once a day in the 2008 survey increased according to the child's age. Almost two-thirds of the 12- to 14.9-month age group consumed some type of sweet or sweet beverage every day, and this proportion rose to 80.6% among 21- to 23.9-month-olds. Daily consumption of salty snacks rose from 10.4% among 12- to 14.9-month-olds to 23.7% of 21- to 23.9-month-olds.³⁰

Negative findings. Many young children are not eating enough fruits and vegetables, the 2008 FITS shows (see **Figure**). The percentage of children who consumed any fruit at least once a day ranged from a low of 18.5% among 4- to 5.9-month-olds to a high of 84% among 18- to 20-month-olds, a significantly larger proportion of the older group than the 2002 FITS showed. Among some age groups (4- to 5.9-month-olds and 6- to 8.9-month-olds), however, the proportion who consumed any fruit at least once a day declined significantly from 2002 to 2008. But a far larger proportion of children 18 to 20.9 months of age consumed both jarred baby food fruit and other fruit in 2008 than in 2002.³⁰

As for vegetables, the proportion of children who consumed any vegetable at least once a day changed little from 2008 to 2002, and in 2008 ranged from 25.9% among 4- to 5.9-month-olds to 72.4% among 12- to 14.9-month-olds. Although consumption of French fries declined from 2008 to 2002 among children 12 to 14.9 months of age, so did consumption of other, more nutritious vegetables, such as green beans, squash, and tomatoes. In fact, French fries (or other fried potatoes) were the most popular vegetables among the age groups encompassing 12 through 23.9 months, with 19% to 26.2% of children in this age range eating them at least once a day.³⁰ Children younger than 12 months were more likely than toddlers to eat dark green, orange, and yellow vegetables, including sweet potatoes, carrots, green beans, and broccoli.

Results of the FITS 2008 also raise other concerns. These include concerns about preschoolers' eating too much saturated fat and not having enough healthy fats in their diets to provide adequate essential fatty acids. The decline in consumption of iron-rich infant cereal in 4- to 5.9-month-olds and 9- to 11.9-month-olds is another worry. So is an 80% decline in the percentage of 9- to 11.9-month-olds who ate baby food meats without a compensating increase in other protein sources. However, the oldest toddlers and children 12 to 14 months old increased their consumption of yogurt and other protein sources.³⁰

Although most FITS toddlers had nutritionally adequate diets overall, they consumed a less-than-ideal level of vitamin E, potassium, and fiber. On the other hand, they ingested too much preformed vitamin A, zinc, and sodium.³²

GETTING THE MESSAGE ACROSS TO PARENTS

Educating parents about how to prevent obesity in their children begins in the

pediatric practitioner's office with the recognition of youngsters who are at risk for overweight/obesity. When, how, and what prevention information to deliver are the next considerations.

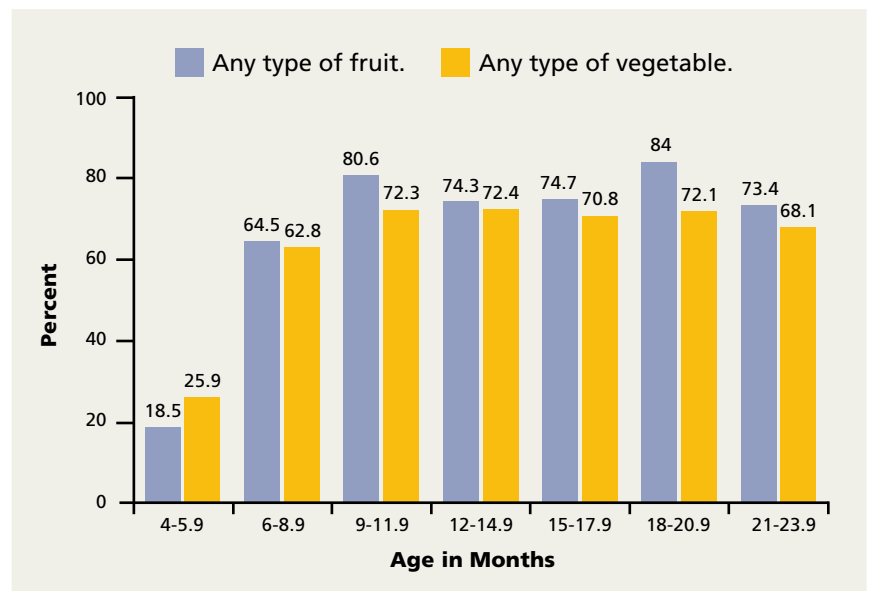
Recognizing unhealthy weight gain. In September 2010, the Centers for Disease Control and Prevention (CDC) issued a recommendation that US clinicians use the growth charts released by the World Health Organization (WHO) in 2006 (available at www.who.int/childgrowth/standards/en) rather than the traditional CDC growth charts for children younger than 24 months. (CDC charts still are recommended for use in individuals 2 to 19 years of age.)³³ The CDC noted that the WHO charts are growth *standards* that describe the growth of healthy children under optimal conditions—all of the reference population of infants were breastfed for 12 months and were predominantly breastfed for at least 4 months. In contrast, the CDC charts are only growth *references*, even though clinicians misguidedly tend to use them as standards.

The CDC also recommends that practitioners use the 2nd and 98th percentiles on the WHO charts as the screening cutoff for abnormal or unhealthy growth.

By using the WHO charts instead of the traditional CDC charts for infants, practitioners will identify fewer children as underweight, as the WHO charts indicate that a slowed weight gain between 3 and 18 months is normal in breastfed infants. In this instance, the practitioner can reassure parents that their child does not need to eat more. Clinicians also should find it easier to identify formula-fed infants whose rapid weight gain causes an upward crossing of growth percentiles. In this case, the pediatrician can counsel parents about modifying how and what they feed their infants to help slow their weight gain.³⁴

The AAP¹ and findings from the FITS³⁰ indicate that parents often think their child is healthy-looking rather than chubby. Clinicians need to educate parents about their misguided perceptions

FIGURE. 2008 FITS: Percentage of Children Who Eat Any Fruit or Vegetable on a Given Day



FITS = The Feeding Infants and Toddlers Study.
Siega-Riz AM, Deming DM, Reidy KC, et al. *J Am Diet Assoc.* 2010;110(suppl):S38-S51.

PEDIATRIC OBESITY: AN INCREASING PROBLEM

TABLE 1. Anticipatory Guidance for Avoiding Overweight/Obesity in Early Childhood

Period/Age	What to Tell Parents
Prenatal period	<ul style="list-style-type: none"> • Avoid excessive gestational weight gain because it has been associated with offspring overweight/obesity. • Do not smoke. • Plan to breastfeed, which has been identified as a protective factor against overweight/obesity along with its many other benefits. • Breastfeeding also allows infant to self-regulate food intake.
Early infancy (to 4 months)	<ul style="list-style-type: none"> • Try to breastfeed exclusively for 4 to 6 months or longer.¹ • Be alert to infant satiety cues, respect them, and do not push baby to eat more. Cues include spitting out or refusing nipple, falling asleep, and becoming fussy during feeding. • Do not feed any solids.
Later infancy (4 to 12 months)	<ul style="list-style-type: none"> • Introduce solid foods from 4 to 6 months. • Continue to respond to satiety cues, such as pushing the spoon away, closing mouth as spoon approaches. • Add new foods (a single ingredient at a time)¹ at 2- to 7-day intervals, such as fruits and vegetables, then pureed meats. Older infants may accept combination foods after establishing tolerance for individual components. • At about 9 months, introduce a variety of finger foods¹ and table foods that are soft and easy to chew, taking care to avoid choking hazards, such as hot dogs, nuts, grapes, and popcorn. • Present fruits and vegetables at every meal and use them as snacks. • Plan 3 regular meals and 1 to 2 snacks and avoid “grazing” during the day. • By 12 months, serve all drinks in a cup, not a bottle,¹ because extended bottle use is associated with increased risk for obesity. • Encourage physical activity: crawling and exploring.² • Avoid TV time completely until child is at least 2 years old.²
Toddler and preschool period	<ul style="list-style-type: none"> • Continue to introduce a variety of foods, keeping in mind that a toddler must on average be offered a new food 10 or more times before accepting it. • Satiety cues at this age include slowing the pace of eating, being distracted, playing with or throwing food, and/or leaving the table. • Do not mix existing preferred food with new texture—child often will reject both foods. • Limit TV time to no more than 2 hours a day in child 2 years or older¹ (no TV time at younger age) and instead encourage physical activity. Establish habit of daily exercise; 60 minutes of structured play and another 60 minutes of free play is ideal. • Do not push child to eat; until about 4 years of age, child recognizes caloric needs and eats to that level but by 1 or 2 years of age is influenced by the eating habits of the family—so be a good role model. • Goal is 3 nutritious meals and 1 or 2 healthy snacks a day; choose when and what to eat and let child decide how much. • Use low-fat dairy products and 100% fruit juice (just once a day).² • Avoid/limit high-sugar juices³ and sodas and salty snacks.⁴ • Have a regular family evening meal and make sure the child has sufficient sleep,² both of which are associated with less likelihood for obesity.
Elementary school period	<ul style="list-style-type: none"> • Continue to be a good role model as self-regulation is replaced by “habit” eating, influence of role models, and media.⁵ • Minimize eating out and eat healthy meals at home as a family most nights. • Offer 5 servings of fruits and vegetables each day. • Limit portion sizes. • Do not give high-fat, high-density snacks as a reward or ban these foods as punishment, because doing so increases their appeal. • Encourage child to eat breakfast every day.² • Do not allow a TV set in child’s bedroom. • Keep TV time to less than 2 hours a day and increase physical activity.

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of their child's weight and the implications for their future weight and health. Parents themselves may be overweight, compounding the challenging aspects of addressing this issue. Dietetics practitioners in particular have skills geared to deal with the different parental perceptions and concerns about children's weights.³²

When and how to offer anticipatory guidance on feeding. The clinician should take advantage of the many "windows of opportunity" in a pediatric practice to offer parents advice about good feeding practices. The first of these opportunities arises during the prenatal period, when the prospective mother can be advised about the dangers to her unborn baby of gaining more than the optimum amount of weight. The perinatal period is ideal for pointing out that breastfeeding, among its many other virtues, offers a protective effect against excessive infant weight gain. All clinic visits, especially well-child appointments, offer an opportunity for guidance on good feeding practices appropriate to the child's age, such as allowing for self-regulation of food intake for infants and toddlers and introducing new, nutritious foods in a timely manner (see Table 1).

Behavioral Aspects of Family Life

It is important for practitioners to start early the conversation with parents about acting as role models for healthy eating habits for their children,³² as parents provide the strongest example for their young child. If parents themselves are overweight, that issue may need to be addressed as well. FITS data suggest a need to emphasize healthy eating patterns for the entire family, since family fare may contribute to current problems with preschoolers' intakes and also set the stage for later diet-related problems.³²

Pediatricians ideally should promote the benefits of family meals³² and family activity, along with the "Let's Move"

campaign,²⁰ and provide guidance to help the entire family implement healthy dietary practices.³⁵

Because 15% of children younger than 1.5 years of age³⁰ and 40% of children 1 to 5 years of age³⁶ have TVs in the bedroom, clinicians should consider bringing up the issue of TV, particularly with regard to physical activity, with parents during their child's infancy.

Practitioners also should advise against eating when sitting in front of the TV. Studies show that children who eat in front of the TV consume higher amounts of fat and salt and fewer fruits and vegetables and may have increased caloric consumption.

Additionally, clinicians should consider discussing with parents sweet beverages for their infants. AAP recommends no more than 4 to 6 oz of juice per day for children 1 to 6 years of age and no more than 8 to 12 oz for those 7 to 18 years.¹ Practitioners should promote the consumption of water for infants older than 1 year of age who are thirsty.

For children older than 2 years of age, the rubric 5-2-1-0 is helpful: 5 servings of fruits and vegetables per day, no more than 2 hours of TV time per day, 1 hour of physical activity per day, and 0 sweet beverages.



"Motivational interviewing" is a cognitive-behavioral technique that can help parents identify and change targeted behaviors.

Motivational Interviewing

"Motivational interviewing" is a cognitive-behavioral technique that can help parents identify and change targeted behaviors—in this case, less-than-optimal feeding habits in their children.³⁷ A collaborative approach, motivational interviewing can be much more effective at facilitating behavioral change than the traditional authoritarian "doctor as expert" interaction.³⁸ The goal is to help parents develop their own reasons for changing their behaviors through asking open-ended questions (such as "What does your child eat for snacks?"), listening carefully to the answers, summarizing what the parent is saying, and exploring the pros and cons of new alternative behaviors. The clini-

Informational Web Sites for Parents and Practitioners

Childhood Overweight and Obesity

www.aap.org/obesity/index.html

Let's Move

www.letsmove.gov/

Ounce of Prevention Is Worth a Pound

www.theounceofprevention.org

Healthy Children

www.healthychildren.org/english/health-issues/conditions/obesity/Pages/default.aspx

Eat Right

www.eatright.org/Public/

Choose My Plate

www.choosemyplate.gov/

CDC Division of Nutrition, Physical Activity, and Obesity

www.cdc.gov/nccddp/dnpao/index.html

Nutritional and Physical Activity Self-Assessment for Child Care

www.napsacc.org/

KidsHealth

www.kidshealth.org

Shape Up America!

www.shapeup.org/

Team Nutrition

teamnutrition.usda.gov/parents.html

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cian can guide the parent toward change via nonjudgmental counseling that takes into account cultural and cost issues. The idea is to advance the parent's interest in making changes from the "no" stage through the "maybe" stage to the "yes" preparation stage. At the "maybe" stage, the practitioner should address ambivalence and assess readiness for change ("Do you think you are ready to cut back on how much juice you give your toddler?"). Once the parent expresses a desire to change (the "yes" stage), the clinician should work with the parent to make a plan (such as to gradually decrease the amount of fruit juice given to the child), establish a time frame, and follow up.³⁸

Refer parents to useful Web sites for avoiding overweight/obesity and consider creating your own handouts from such sites (**see sidebar: Informational Web Sites for Parents and Practitioners**). To exemplify positive practices, the practitioner can provide a separate room for nursing mothers and remove the TV from the waiting room.

WRAPPING IT UP

Prevention is preferable to treatment, particularly for overweight/obesity, because this condition is so resistant to long-term change. Pediatric practitioners need to be diligent about recognizing excessive weight gain in infants and proactive in taking opportunities to educate parents about how best to feed their children, the importance of other healthy lifestyle choices, and being good role models for healthy eating habits.

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POSTTEST

To participate in this activity and receive your certificate instantly, log on to www.myCME.com/pednutrition and click on the activity to answer the test questions and complete the evaluation form. This program is approved by Albert Einstein College of Medicine of Yeshiva University for physicians for 1.0 *AMA PRA Category 1 credit*[™] and dietitians for one (1) contact hour and by Montefiore for nurses and nurse practitioners for 1 contact hour. To obtain credit, you must receive a score of 70% or better. Expiration date: September 30, 2012.

- 1. From 1999 to 2008, which percentage of children and adolescents from 2 through 19 years of age were at or above the 85th percentile of the body mass index (BMI)-for-age growth charts?**
 - A. 11.9%
 - B. 31.7%
 - C. 9.5%
 - D. 20.8%
- 2. Which of the following is *not* associated with an increased risk for future obesity?**
 - A. Maternal obesity and excess gestational weight gain
 - B. Low birth weight
 - C. Normal infant growth
 - D. Gestational diabetes mellitus
- 3. Some investigators have observed that:**
 - A. Longer duration of breastfeeding is associated with greater protective effects.
 - B. Longer duration of breastfeeding is associated with fewer protective effects.
 - C. Shorter duration of breastfeeding is associated with greater protective effects.
 - D. Duration of breastfeeding made no difference in protective effects.
- 4. Introduction of solid foods before 4 months of age was associated with a six-fold increase in the risk for obesity at 3 years of age in:**
 - A. All infants
 - B. Infants who received equal amounts of breastfeeding and formula feeding
 - C. Breastfed infants
 - D. Formula-fed infants
- 5. Which three household routines were associated with a 40% lower prevalence of obesity in children?**
 - A. Encouraging cleaning one's plate, taking second helpings of preferred foods, and eating take-out 2 nights/week
 - B. Encouraging the choice of carbohydrates, exercise once/week, and limiting the variety of foods eaten
 - C. Getting ≥ 10.5 hours of sleep/night on weeknights, TV viewing ≤ 2 hours/day on weekdays, and family evening meal > 5 nights/week
 - D. Getting < 7 hours of sleep/night on weeknights, TV viewing 2 hours/day on weekdays, and family evening meal 1 night/week
- 6. Findings of the 2008 Feeding Infants and Toddlers Study (FITS) show that:**
 - A. Many young children are not eating enough fruits and vegetables.
 - B. The proportion of youngsters who consumed some type of dessert, sweet, or sweetened beverage, candy, or salty snack at least once a day decreased according to the child's age.
 - C. More children and infants are consuming desserts, sweets, sweetened beverages, and salty snacks in 2008 than they were in 2002.
 - D. Mothers were breastfeeding for shorter periods in 2008 than they were in 2002.
- 7. Pediatricians should do which of the following in helping to prevent obesity?**
 - A. Use the traditional CDC growth charts for children younger than 24 months.
 - B. Educate parents about their misguided perceptions of their child's weight and the implications for their future weight and health.
 - C. For a slowed weight gain between 3 and 18 months in breastfed infants, tell parents that their child must eat more.
 - D. Counsel mothers that breastfeeding can promote infant overweight.
- 8. Practitioners ideally should promote which of the following with regard to healthy dietary practices?**
 - A. The benefits of family meals
 - B. The benefits of family activity
 - C. Avoid eating in front of the television
 - D. All of the above

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