Policy on Dietary Recommendations for Infants, Children, and Adolescents

Latest Revision

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Purpose

The American Academy of Pediatric Dentistry (**AAPD**) recognizes its role in promoting well-balanced, low caries-risk, and nutrient-dense diets for infants, children, adolescents, and persons with special health care needs. A healthy diet is essential to optimal growth and development and prevention of chronic diet-related diseases such as caries, obesity, and cardiovascular disease.

Methods

This policy was developed by the Clinical Affairs Committee, adopted in 1993[1], and last revised in 2017[2]. This revision is based upon a review of current dental and medical literature, including a search of the PubMed®/MEDLINE database using the terms: childhood, obesity, dental caries, diet, nutrition, health education, breastfeeding, food habits, dietary guidelines, sugar, sugar-sweetened beverages, and body mass index; fields: all; limits: within the last 10 years, humans, English, clinical trials, and ages birth through 18. Papers for review were chosen from the resultant lists and from hand searches. Expert and consensus opinions by experienced researchers and clinicians, including recommendations[3] developed through a collaboration of the Academy of Nutrition and Dietetics (**AND**), the AAPD, the American Academy of Pediatrics (**AAP**), and the American Heart Association (**AHA**) under the leadership of Healthy Eating Research, also were considered.

Background

A healthy diet in early childhood is essential to supporting optimal growth and development and preventing chronic diet-related diseases. Experts across health care disciplines recognize the importance of breastfeeding during infancy.[3,4] Human milk and breastfeeding of infants provide general health, nutritional, developmental, psychological, social, economic, and environmental advantages while significantly decreasing risk for a large number of acute and chronic diseases.[5] A systematic review of cariogenic potential of milk and infant formulas in animal models found that cow's milk and human milk are less cariogenic than sucrose solutions.[6] Another systematic review concluded that children exposed to long durations of breastfeeding up to age 12 months had reduced risk of caries.[7] However, children breastfed more than 12 months had an increased risk of caries, and those children breastfed nocturnally or more frequently had a further increased caries risk.[7]

The causes of dental caries and obesity are multifactorial, with both having significant dietary components. Beverages contribute significantly to the early diet. A 2019 consensus statement, *Healthy Beverage Consumption in Early Childhood: Recommendations from Key National Health and Nutrition Organizations*, was developed through a collaboration of AND, AAPD, AAP, and AHA under the leadership of Healthy Eating Research, a nutrition research organization.[3,4] These organizations recommend breast milk, infant formula, water, and plain milk for children under age five.[3] They suggest that plain (i.e., not flavored, sweetened, or carbonated) fluoridated water should be introduced beginning at six months of age for children who have started solid foods to familiarize the child with water as well as with drinking from a cup; the volume of water offered is based on the intake of other recommended beverages.[3,4] Drinking fluoridated water is a safe and effective method of reducing caries.[8] Fluoridated water is preferred beverage for children one to five years of age when consumed outside of meals or snacks.[4] The consensus statement cautioned against beverages that are sources of added sugars, including flavored milks (e.g., chocolate, strawberry), or contain low-calorie sweeteners (**LCS**).[3] Because the long-term health effects of consumption of LCS by children is unknown,[4] the statement recommended against consumption of LCS through age five.[3] In addition, it advised against a wide variety of new beverages on the market targeted to children (e.g., toddler formulas) and caffeinated beverages.[3] Plant-based/nondairy milks (e.g., almond, rice, oat) were noted to provide no unique nutritional value, but unsweetened varieties may be useful when medically indicated (e.g., allergy or intolerance to cow's milk) or to meet specific dietary preferences (e.g., vegan).[3,4]

Food and flavor preferences may be established during the early years.[4,9] Establishing health dietary patterns during the first two years of life can have lifelong health benefits.[9] The

ABBREVIATIONS

AAP: American Academy of Pediatrics. **AAPD:** American Academy of Pediatric Dentistry. **AND:** Academy of Nutrition and Dietetics. **AHA:** American Heart Association. **BMI:** Body mass index. **LCS:** Low-calorie sweetners. **NHANES:** National Health and Nutrition Examination Survey. **SCB:** Sugar-containing beverages. **SSB:** Sugar-sweetened beverages. **U.S.:** United States. **USDA:** United States Department of Agriculture.

AHA recommends that children less than two years of age avoid added sugars in their diets.[10] Sugar-sweetened beverages (**SSB**) include any liquid (e.g., regular soda, fruit drinks, sports drinks, tea and coffee drinks, energy drinks) with added sugar (e.g., fructose, corn syrup, sucrose [table sugar]).[11] A longitudinal study found introduction of SSB before age one was associated with obesity at age six.[12] Sugar-containing beverages (**SCB**) include SSB as well as beverages in which sugar, generally glucose or fructose, is naturally present, such as 100 percent fruit juice. In 2017, the AAP reaffirmed that 100 percent juice and juice drinks have no essential role in a healthy diet for children and contribute to excessive calorie intake and risk of dental caries in children.[13] AAP recommendations include: juice should not be introduced to infants before one year of age; intake of juice should be limited to four ounces a day for children one through three years of age, four to six ounces for children four through six years of age, and eight ounces for children seven through 18 years of age; toddlers should not be given juice in containers that foster easy consumption; and toddlers should not be given juice at bedtime.[13] The mentioned volumes are recommended maximums, not daily requirements, and fresh fruit is preferred to fruit juice.[13]

Unfortunately, many parents do not adhere to evidence-based dietary recommendations for their children. For example, many infants are provided 100 percent juice and cow's milk before age one, which can increase their risk for nutrient (e.g., iron[14]) deficiencies.[4] Nearly half of two- to five-year olds consume a SSB daily, with the prevalence increasing throughout childhood.[4] Children and adolescents in the United States (**U.S.**) consumed an average of 143 calories/day from SSB between 2011-2014, and 7.3 percent of their daily energy intake came from SSB.[15] Significant differences in beverage intake by race/ethnicity and income groups in early childhood have been noted.[4]

Dental caries prevalence in children has been variable but remains high.[16] The prevalence of dental caries (untreated and treated) in primary or permanent teeth among children aged two through 19 years has been estimated at 45.8 percent.[16] The causes of dental caries involve a combination of factors including diet, bacteria capable of fermenting carbohydrates, fluoride exposure, and a susceptible host.[17] While sugar, especially high frequency consumption, contributes to dental caries, a systematic study of sugar consumption and caries risk concluded that the relationship between sugar consumption and caries risk is weaker after the introduction of fluoride exposure.[18]

The causes of obesity include genetic components, lifestyle, and environmental variables, as well as nutritional factors.[19] When consumed in excess, beverages containing sugar or saturated fats can be harmful.[3] Health initiatives in the U.S. and other countries have specifically targeted SSB in an effort to reduce the number of calories that children and adolescents consume per day.[20] Data from the 2017-2018 National Health and Nutrition Examination Survey (**NHANES**) indicate that for children and adolescents aged two through 19, the prevalence of obesity is an estimated 19.3 percent, including 6.1 percent with severe obesity and another 16.1 percent overweight.[21] The obesity rate increases through childhood and adolescence, and youth with obesity are at increased risk for health problems (e.g., heart disease, type 2 diabetes) during the teenage years and beyond.[22]

While dental caries and obesity are both significant pediatric health problems, the relationship between caries and anthropometric measurements is complex. Multiple systematic reviews have reported inconsistent and inconclusive evidence on the relationship between caries and body mass index (**BMI**).[23-26] BMI is a simple, non-invasive means to monitor growth patterns and help assess the risk of obesity. Forms to record BMI for age and gender can be downloaded from the website of the Centers for Disease Control and Prevention at "https://www.cdc.gov/growthcharts/clinical_charts.htm#Set1".[27] Because of the persistent high prevalence of dental caries and childhood obesity, the need remains for research, policy, advocacy, education, and professional engagement to further advance healthy dietary practices for infants, children, and adolescents.

The U.S. Department of Health and Human Services and the U.S. Department of Agriculture (**USDA**) develop dietary guidelines every five years to help Americans aged two and older make healthy food choices to help prevent chronic disease and enjoy a healthy diet. The 2020-2025 *Dietary Guidelines for Americans* includes four overarching guidelines:

- "Follow a healthy dietary pattern at every life stage.
- Customize and enjoy nutrient-dense food and beverage choices to reflect personal preferences, cultural traditions, and budgetary considerations.
- Focus on meeting food group needs with nutrient-dense foods and beverages, and stay within calorie limits.
- Limit foods and beverages higher in added sugars, saturated fat, and sodium, and limit alcoholic beverages."[22]

The *Dietary Guidelines for Americans* also provides specific quantitative recommendations including limiting:

- "Added sugars—Less than 10 percent of calories per day starting at age two. Avoid foods and beverages with added sugars for those younger than age two.
- Saturated fat—Less than 10 percent of calories per day starting at age two.
- Sodium—Less than 2,300 milligrams per day—and even less for children younger than age 14."[22]

To prevent unhealthy weight gain, the World Health Organization recommends energy intake and expenditure be balanced, with a goal of total fat not exceeding 30 percent of energy intake and a shift from away from saturated fat and trans-fats.[28] Limiting intake of free sugars to less than five percent of total energy intake per day offers additional health benefits.[28] Additionally, the AHA recommends limiting consumption of added sugars to no more than six percent of

calories[29]; for children and adolescents, their recommended limit is less than 25 grams (100 calories or approximately six teaspoons) of added sugar per day.[10] One should note that eight ounces (i.e., one measured cup) of regular soft drink contain approximately 26 grams of sugar; a 12 ounce can of regular soda contains approximately 10 teaspoons of sugar and has no nutritional value[29].

Snacking can help a child meet daily nutritional requirements. Nearly 25 percent of children's daily caloric intake may come from snacks.[30] The AAP recommends that toddlers be given two to three healthy snacks daily to supply nutrients that the child cannot consume at mealtime; they should be consumed at a planned time while seated with adult supervision.[31] The AAP cautions against confusing snack time with treats for fun as well as continuous/all day snacking.[31] Frequent (more than three times/day) exposure to between-meal sugar-containing snacks or beverages categorizes a child at high risk for dental caries.[32] If a child is given continuous access to a bottle or cup, it should contain only water.

The USDA has established guidelines for healthy snacks at school.[30] Standards for foods to qualify as a school "smart snack" include:

- "Be a grain product that contains 50 percent or more whole grains by weight (have a whole grain as the first ingredient); or
- Have as the first ingredient a fruit, a vegetable, a dairy product, or a protein food; or
- Be a combination food that contains at least ¼ cup of fruit and/or vegetable (for example, ¼ cup of raisins with enriched pretzels); and
- The food must meet the nutrient standards for calories, sodium, fats, and total sugars".[30]

Using 2017-2018 NHANES data, the USDA reported approximately 20 percent of youth aged 12 through 19 years consumed more than three snacks daily.[33]

Establishment of a dental home by 12 months of age provides time-critical opportunities to assess caries risk and implement individualized caries-preventive strategies, including dietary recommendations and appropriate oral hygiene instruction, as the primary teeth begin to erupt.[34] A diet that avoids frequent consumption of liquids and foods containing sugar is essential to good oral health. The dental home also can influence general health by instituting additional practices related to general health promotion, disease prevention, and screening for non-oral health related concerns. For example, oral health professionals can calculate and monitor BMI to help identify children at risk for obesity and provide appropriate referral to pediatric or nutritional specialists. A 2016 survey of pediatric dentists reported that 17 percent offer childhood obesity interventions, while 94 percent offer information or other interventions on the consumption of sugar sweetened beverages.[35] Barriers to providing healthy weight interventions include fear of offending the parent, appearing judgmental, creating parent dissatisfaction, and lack of parental acceptance of advice about weight management from a dentist.[35]

Policy statement

The AAPD recognizes a healthy diet in early childhood is essential to optimal growth and development and prevention of chronic diet-related diseases such as caries, obesity, and cardiovascular disease. Through dietary and nutritional counseling, dentists assume a significant role in preventing oral disease and promoting overall health among children. The AAPD especially recognizes the importance of and supports:

- breastfeeding of infants prior to 12 months of age to ensure the best possible health and developmental and psychosocial outcomes for infants.
- the introduction of plain, fluoridated water to the infant's diet beginning at age six months for hydration, to familiarize the child with the taste, and for the caries-protective benefits of fluoride.
- fluoridated water as the preferred beverage for children from one to five years of age when not part of a meal or snack.
- avoiding added sugars in the diet of children younger than age two and minimizing exposure to sweet-tasting drinks and foods during early life to reduce taste preferences for sweets.
- recommendations from the USDA for individuals aged two and older to consume a diet of nutrient-dense, lean or low-fat foods from across five food groups (i.e., fruits, vegetables, protein, grains, and dairy) that are prepared without added salt, starches, sugars, or fat.
- limiting consumption of sugar to less than five percent of total energy intake to reduce children's risk of weight gain and dental caries.
- establishing healthy beverage consumption patterns during the first five years to promote intake of healthy nutrients, limit excess intake of sugars and saturated fats, and initiate beneficial long-term dietary habits.
- nonsweetened nutrient-dense snacks that supplement meals to meet daily nutritional requirements.
- additional health practices such as meal portion control and energy balance to help prevent overweight and obesity.

Furthermore, the AAPD encourages:

- education of health professionals and the public regarding healthy beverage choices and daily sugar-consumption recommendations, as well as the sugar content of foods and beverages.
- dental professionals to identify children whose dietary patterns place them at increased risk for dental caries and obesity and, when necessary, refer for dietary counseling from a pediatric or nutritional specialist.
- a healthy, active lifestyle so energy consumption and energy expenditure promote general health and well-being.
- additional research on the benefits and effects of long-term use of low-calorie sweeteners by children.

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