

Nutrition in Healthy Preschool-Aged Children

What We Know

- › Preschool-aged children (i.e., those aged 3–5 years) have mastered the skill of self-feeding and are capable of eating a wide variety of foods⁽⁵⁾
 - The preschool period is a time of activity, exploration, and learning. Preschool-aged children typically show signs of independence and rebellion by around 4 years of age. The period of independence and rebellion is frequently accompanied by finicky eating that is similar to the erratic eating choices and behaviors of toddlers⁽⁵⁾
 - Fluctuations in the preschooler’s food preferences can cause parents/caregivers to become concerned about whether the child is consuming enough food or has a healthy enough diet. There is evidence, however, that children self-regulate their dietary intake to meet their energy needs. If they pick at one meal and not eat well, they tend to eat more at another. By the age of 5 years, the phase of rebellion passes and most children are willing to try new foods⁽⁵⁾
- › Dietary recommendations for children 3–5 years of age
 - Since the lifetime eating habits are established in early childhood, it is vital that parents/caregivers encourage healthy eating habits when children are very young. Encouraging healthy eating habits involves offering a variety of fruits, vegetables, whole grains, and lean proteins throughout the day, keeping in mind that many food items are typically rejected several times before the child agrees to sample them⁽¹¹⁾
 - Although eating fruit is recommended, juice intake should be limited to 4–6 oz/day of 100% fruit juice. Excessive consumption of juice and other sweetened beverages is linked to dental caries, chronic diarrhea, and imbalanced diets in which fruit juice replaces necessary nutrient intake from other foods. Soda, punch, and other sugary drinks are not recommended^(9,10)
 - The recommendations for calorie and macronutrient intake for preschool children include the following:
 - Calories: 1,000–1,400 kcal/day⁽¹⁰⁾
 - Protein: 13–19 g/day⁽¹⁰⁾
 - Carbohydrates should represent 45–65% of total calories consumed/day, with no more than 10% from added sugars⁽¹⁰⁾
 - Fiber: 14–20 g/day⁽¹⁰⁾
 - Fat: Total fat intake should account for 30–40% of daily kcal in children aged 2–3 years and 25–35% of daily kcal in children aged 4–8 years⁽¹⁰⁾
 - Saturated fat consumption comprising less than 10% of total caloric intake. Trans fats, such as those found in many processed foods, should be avoided⁽¹⁰⁾
 - Milk is a vital source of nutrients during the preschool years, including calcium and vitamin D; intake of milk should average 2–3 servings (24–30 oz) per day. Children who do not drink milk should receive alternative sources of calcium and vitamin D^(5,11)
 - Low-fat milk can be offered after age 2 years to encourage moderate intake of dietary fat; intake of low-fat milk can be up to 30% of daily calories⁽⁵⁾

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- Daily intake of 700 mg of calcium is recommended for children 1–3 years of age, and 1,000 mg/day is recommended for children 4–8 years of age.^(8,10) Food sources of calcium other than milk include the following:
 - Milk-based products, including yogurt and low-fat cheese^(2,8,10)
 - Beans^(2,8)
 - Green and leafy vegetables, including collard greens, broccoli, and kale^(2,8)
 - Calcium-fortified foods, including orange juice, waffles, and cereals⁽⁸⁾
- 600 international units (IU) per day of vitamin D is recommended.^(7,10) Food sources of vitamin D other than milk include the following:
 - Fish and fish oils^(2,7)
 - Egg yolks^(2,7)
 - Fortified milk and plant-based milk products^(2,7,10)
- Iron-rich foods are recommended to prevent iron-deficiency anemia, which is a common risk in young children. Foods that are rich in iron include the following:
 - Iron-fortified cereals that are not high in sugar; high-sugar cereals should be avoided to prevent dental caries and obesity^(6,10)
 - Red meats, poultry, and fish^(6,10)
 - Dried fruit⁽⁶⁾
 - Beans^(6,10)
- Parents/caregivers are encouraged to create a positive eating environment for children, including the following:
 - Keep mealtime pleasant and avoid arguments, which can cause preschool children to attach negative feelings to eating. Children are less likely to try new foods that are introduced in a negative environment⁽¹¹⁾
 - Allow ample time for eating. Children need time to smell, taste, and touch their food. Rushing them can add stress during mealtimes⁽¹¹⁾
 - Be patient with spills and accidents because they are part of the preschooler's learning process⁽¹¹⁾
 - Provide utensils that can be held and put into the mouth easily and use break-resistant dishes and glasses⁽¹¹⁾
 - Create a mealtime environment that offers an opportunity for family interaction so preschoolers can witness positive eating habits modeled by their parents/caregivers. Children are more likely to try a new food if they see their parents/caregivers and older siblings eating it^(9,11)
- › Assessing the nutritional status of preschool children
 - Growth charts are available to monitor weight gain and height of children at expected norms by age. Although the goal is for the measurements to fall between the 5th and 95th percentile on the growth charts, consistent growth patterns are the best indication of nutritional adequacy in preschoolers^(1,9,11)
 - Physical indicators of inadequate nutrition include the following:^(1,2)
 - Poor weight gain or weight loss
 - Listless or apathetic demeanor
 - Brittle, spoon-shaped fingernails
 - Dry, brittle hair
 - Constipation and/or diarrhea
 - Weak musculature
 - Poor reflexes
- › Findings of recent research on nutrition in healthy preschool children
 - Preschool-aged children's diets appear to be different when they are with their parents compared with when they are with other caregivers. In a study of 1,218 preschool children in the UK, children ate more calories, sodium, added sugars, vegetables, and saturated fats when eating with their extended family compared with when eating with their parents. In addition, they ate less added sugar and more fruit when they were a formal caregiver compared with when they were with their parents⁽⁴⁾
 - Preschool-aged children who are picky eaters at risk of undernutrition may benefit from oral nutritional supplementation. Researchers in India randomized 321 such children to receive oral nutritional supplements plus dietary counseling or

dietary counseling alone and found that those receiving oral nutritional supplements experiences significantly greater improvements in weight and BMI⁽³⁾

What We Can Do

- › Become knowledgeable about nutrition in healthy preschool children so you can accurately assess your patients' characteristics and health education needs; share this information with your colleagues
- › Assess risk in preschool children for inadequate and excessive weight gain and growth, and provide detailed and relevant patient/family dietary counseling, if appropriate
- › Assess patient/family knowledge deficits about nutrition and the prescribed dietary regimen, if ordered, and emphasize the importance of providing healthy food choices, adhering to the prescribed dietary regimen, and continued medical surveillance to monitor the preschooler's growth and nutritional status

Coding Matrix

References are rated using the following codes, listed in order of strength:

M Published meta-analysis	RV Published review of the literature	PP Policies, procedures, protocols
SR Published systematic or integrative literature review	RU Published research utilization report	X Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	QI Published quality improvement report	GI General or background information/texts/reports
R Published research (not randomized controlled trial)	L Legislation	U Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	PGR Published government report	CP Conference proceedings, abstracts, presentation
G Published guidelines	PPR Published funded report	

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