Strategies for Pediatric Practitioners to Increase Fruit and Vegetable Consumption in Children

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Choices individuals make around what, where, and how much they eat and drink are influenced by many factors. Various socioecological models have been proposed to explain how these multiple factors of influence can shape individual behavior.[1,2] The framework proposed by Story and colleagues[1] groups these factors into 4 main levels: individual (eg, skills, preferences), social environment (eg, social support), physical environment (eg, retail and food service opportunities in settings such as schools, worksites, early care and education, and the broader community), and macrolevel influences (eg, systems-level factors such as social norms, food marketing, and food production). Health care providers traditionally have focused on individuals and individual factors to improve patient health, such as knowledge about the importance of healthy behaviors and improved self-efficacy to make healthy choices.[3] However, there is growing recognition that a focus on the individual is not sufficient and strategies acting at multiple levels are needed to improve health, including diet quality. This recognition has led the public health community, including health care providers, to augment individually focused strategies with policy, systems, and environmental approaches.[3,4] These methods emphasize the importance of

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a coordinated, systems-wide approach that engages individuals, families, communities, organizations, health professionals, and policymakers. This broad approach recognizes that, although individuals are responsible for their own health, opportunities need to be available in order for individuals to make healthy choices.

Establishing healthy eating habits early in life may have lifelong impacts on individuals. Dietary exposures and practices in early childhood and youth predict dietary behaviors in adolescence and adulthood.[5–7] The pediatric practitioner can positively influence fruit and vegetable (FV) consumption of children by considering all levels of the socioecological model. Through counseling during clinic visits, the practitioner may be able to directly influence the food choices of caregivers and their children. Practitioners can also recommend community resources to improve access to healthier foods, such as FV, and be community advocates for these resources. By creating a healthy environment in the clinical setting, practitioners can provide healthy options for patients, families, and employees, and serve as role models for the community.

This article reviews the importance of FV consumption, recommended intakes for children, and strategies by which pediatric practitioners can influence FV consumption of children where they live, access care, play, and learn. These strategies are summarized in **Box 1**.

FV provide many important nutrients, including potassium, folate, fiber, vitamin A, vitamin C, vitamin K,[2] and many phytochemicals.[8] Higher intake of FV is associated with a decreased risk for many chronic diseases including heart disease,[9] stroke,[10] diabetes,[11] and some cancers.[12] In addition, replacing energy-dense foods with FV may assist in healthy weight management.[13] This benefit is especially important given the childhood obesity epidemic in the United States, where 32% of children 2 to 19 years old are overweight or obese (defined as body mass index [BMI] for age equal to or greater than the 85th percentile) and 17% are obese (BMI for age equal to or greater than the 95th percentile).[14] The *Expert Committee Recommendations on the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity* states that pediatric weight management and behavioral counseling should include encouraging families to consume recommended levels of FV.[15]

Because of the many benefits of FV consumption, the *Dietary Guidelines for Americans, 2010* (DGA 2010) recommends increased consumption of FV for all Americans 2 years and older, and emphasizes the importance of eating a variety of these foods, specifically mentioning dark green, orange, and red vegetable subgroups.[2] DGA 2010 stresses the importance of whole food sources (fresh, frozen, canned, and dried), rather than juice, because juice may contain less fiber and other important nutrients.[2] When juice is consumed, it should be 100% fruit or vegetable juice. The American Academy of Pediatrics (AAP) recommends no more than 120 to 180 mL (4–6 ounces) of 100% juice daily for children 1 to 6 years of age and no more than 240 to 360 mL (8–12 ounces) daily for children 7 to 18 years of age.[16]

The US Department of Agriculture's (USDA) food guide, MyPlate, highlights the importance of FV as part of a healthy diet with its key message of "Make half your plate fruits and vegetables." MyPlate's FV recommendations are based on an individual's caloric requirements, which depend on age, sex, and physical activity level. Among sedentary youth, recommendations range from 1 cup of fruit and 1 cup of vegetables for boys and girls 2 to 3 years old, to 1.5 cups of fruit and 2.5 cups of vegetables for girls 14 to 18 years old and 2 cups of fruit and 3 cups of vegetables for boys 14 to 18 years old (individuals with higher levels of physical activity need more). Caregivers and practitioners can refer to MyPlate (www.MyPlate.gov) for individualized FV recommendations, information on serving sizes, and an overall healthy eating plan.