

Nutrition in Children and Adolescents



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KEY POINTS

- The healthiest and most appropriate feeding at birth for a newborn infant begins with their own mother's breastfeeding.
- Parents control the home food environment and should ensure preferential access to healthful foods, allowing children to choose among these options.
- Parents should also be alert to foods that present a choking hazard. Children do not learn to chew with a grinding motion until age 4.
- Existing data demonstrate that children generally do not meet recommended targets for a healthy diet.
- Chronic illnesses can have their onset during adolescence. These diseases may be further complicated by nutritional deficiencies.

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INTRODUCTION

In some aspects, pediatric nutrition is easier than adult nutrition, in that children have a ready “marker” for nutrition status: growth. Although an approximation, appropriate growth implies adequate intake of the basic nutrients. Thus, one of the best initial tools to assess nutritional status in pediatric patients is the standardized growth curves. There are curves for length (age <3 years), height (for >3 years), head circumference (age <3 years), and weight (both under and over 3 years). Children under 2 years of age are plotted on the World Health Organization (WHO) growth curves and those 2 years of age and older on the Centers for Disease Control and Prevention (CDC) curves.^{1,2}

In other aspects, however, pediatric nutrition is more difficult. The caloric needs vary by age, as does the need for various nutrients. In gross terms, the most rapid growth occurs during infancy and the number of calories needed per kilogram body weight is the greatest. The growth then slows and the number of calories per kilogram body weight decreases. But because the child is constantly growing, the total number of calories needed is always increasing. For other nutrients such as calcium the needs vary by age with an increased need during puberty. The requirements of the various nutrients over the years have been published.³

Children who fall below the standard growth curves may have malnutrition. There is recognition that malnutrition in the developed world often occurs in the presence of a disease process. These processes are often accompanied by the presence of inflammation, which has profound effects on nutrition and growth. Pediatric malnutrition is now etiology based with a statement of the underlying disease process, whether or not inflammation is present, and then the supportive anthropometric measurements (Table 1).⁴ Chronic malnutrition leads to growth stunting and the loss of potential functional capacity.

This article describes nutritional needs for children and adolescents through developmental stages, and then reviews the influence of nutrition on early brain development, risk for food allergies, and cardiometabolic risks, including obesity, hypertension, and hyperlipidemia.

BIRTH TO 1 YEAR

The healthiest and most appropriate feeding at birth for a newborn infant begins with their own mother’s breastfeeding. The American Academy of Pediatrics (AAP) and the WHO recommend that exclusive breastfeeding should be maintained for at least

	Mild Malnutrition	Moderate Malnutrition	Severe Malnutrition
Weight for height (z score) ^a	–1 to –1.9	–2 to –2.9	–3 or greater
BMI for age (z score)	–1 to –1.9	–2 to –2.9	–3 or greater
Length/height (z score)	No data	No data	–3
Mid-upper arm circumference (z score)	Greater than or equal to –1 to –1.9	Greater than or equal to –2 to –2.9	Greater than or equal to –3

^a The z score is a statistical measurement based on the mean and standard deviation of the distance of a score from the mean in a group of scores.

Data from USDA Center for Nutrition Policy and Promotion. Estimated calorie needs per day by age, gender, and physical activity level. Available at: http://www.cnpp.usda.gov/sites/default/files/usda_food_patterns/EstimatedCalorieNeedsPerDayTable.pdf. Accessed June 9, 2016; and Institute of Medicine. Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids. Washington (DC): The National Academies Press; 2002.

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