

together.

- Limit portion sizes.

Adapted from Davis DM, Gance-Cleveland B, Hassink S, et al: Recommendations for prevention of childhood obesity, *Pediatrics* 120(suppl):S229-S253, 2007.

In patients with severe obesity, strict diets have been used, such as the protein-sparing modified fast, hypocaloric diet, or ketogenic diet ([Sukkar, Signori, Borrini, et al, 2013](#); [Castaldo, Palmieri, Galdo, et al, 2015](#)). These diets are designed to provide enough protein to minimize loss of lean body mass during weight loss. Such diets need to be closely monitored and should be used only with multidisciplinary teams that include a physician, nutritionist, and behavioral therapist. Generally, the diet consists of 1.5 to 2.5 g of protein per kilogram. The intake of carbohydrates is low enough to induce ketosis. The benefits of the diet are relatively rapid weight loss and anorexia induced by ketosis. Potential complications include protein losses, hypokalemia, hypoglycemia, inadequate calcium intake, orthostatic hypotension, and increased risk for osteoporosis. Supplements containing vitamins, minerals, and trace minerals, along with therapeutic doses of vitamin D can minimize these complications ([Kossoff, Zupec-Kania, and Rho, 2009](#)). It is difficult to sustain these diets over the long term, and the long-term outcomes of using these diets have not been established.

Researchers continue searching for medications that will successfully treat obesity. Orlistat, a lipase inhibitor, has been approved for use in children 12 years old and older; however, side effects of the drug include fatty or oily stools and possible malabsorption of fat-soluble vitamins ([Kanekar and Sharma, 2010](#)). There are currently no drugs approved for use in overweight or obese children younger than 12 years old.

**Behavioral modification** approaches to weight loss are based on the observation that obese individuals have abnormal eating practices that can be altered. Attention is focused not on food but on the social and behavioral aspects surrounding food consumption. Successful behavior modification weight programs help adolescents identify and eliminate inappropriate eating habits and include a problem-solving component that enables adolescents to identify problems and determine solutions. Combining