



GUIDELINES FOR PEDIATRICIANS

NUTRITION AND SPORTS

Issue 6

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DEDICATED TO THE HEALTH OF ALL CHILDREN®

Scientific research continues to support recommendations that by eating a healthy balanced diet, young athletes will be able to improve performance and maintain health. Physicians have a special opportunity to provide information that may assist young athletes and their parents in avoiding the pitfalls associated with nutrition misinformation and unsafe practices that seem to promise enhanced performance.

TOPIC	DO	DO NOT
Balanced diet* - Daily caloric intake: 55%-75% carbohydrates, 25%-30% fat, and 15%-20% protein	- Recommend that active teenagers consume 1500-3000 kcal/d more than the recommended daily allowance (RDA) depending on intensity, frequency, and duration of activity. - Allow appropriate vegetarian diets that provide sufficient nutrients.	- Advise decreasing daily caloric intake below level required to maintain growth and development. - Advise increasing any specific individual nutrient unless medically indicated. - Use equations derived from those for adults to determine body composition.
Carbohydrates - Preferred source of energy for exercising	- Recommend that adolescents consume approximately 6-8 g/kg of body weight per day. - Advise athletes to consume carbohydrates immediately after training, because it will increase muscle glycogen stores and improve recovery time.	- Advise limiting carbohydrate intake, because it can be associated with fatigue and decreased physical and mental performance. - Recommend fasting, dieting, or chronically omitting carbohydrate-rich foods, because it will decrease muscle glycogen levels.
Proteins - Daily requirement: approximately 1 g/kg of body weight	- Recommend consumption of up to 2 g/kg during intense strength training in the older adolescent.	- Recommend high protein intakes; this may cause dehydration, increased excretion of calcium, and renal damage. - Recommend intake of large amounts of protein expecting to preferentially stimulate growth in muscle mass. - Recommend intake of excess amounts of protein, because it may be stored as fat.
Vitamins, minerals, and supplements	- Monitor iron status in athletes who complain of fatigue or decreasing performance and in menstruating females. - Advise calcium intakes of 1200-1500 mg/d.*	- Recommend use of megavitamin supplements, which are almost always unnecessary and expensive and may be harmful. - Recommend use of mineral supplements, including salt (as tablet or grain), unless there is a known deficiency.
Hydration (See additional information in Sports Shorts Issue 2: "Exertional Heat-Related Illness")	- Encourage maintenance of hydration, because dehydration may contribute to early fatigue, irritability, or a sudden decline in performance. - Recommend that water or sport drinks are available at all times. - Recommend that athletes are weighed before and after activity to ensure adequate fluid balance.	- Advise athletes to depend on thirst as an adequate indicator of total fluid needs. - Advise ever restricting fluids. - Recommend drinking caffeinated beverages, because they promote diuresis. - Recommend drinking high osmolar fluids (carbonated soda), which may delay gastric emptying and intestinal absorption.

Pre-exercise/Game Meal Guidelines: May include any reasonable food the athlete feels may help his or her performance (some athletes are superstitious).

1. Emphasize consumption of carbohydrates and moderate protein.
2. Limit fatty foods, because they delay gastric emptying; many high-protein foods are also high in fat.
3. Avoid high-fiber (abdominal cramping), salty (fluid retention), and gas-forming foods.

* American Academy of Pediatrics, Committee on Nutrition. *Pediatric Nutrition Handbook*. Kleinman RE, ed. 4th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2000:151, 644.

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Basic Diet: Young athletes need a balanced diet that includes a variety of foods. This is important to improve athletic performance and maintain a healthy body. Ask your pediatrician how many calories your child or teenager needs each day. The daily training diet should include the following amounts of these types of foods:

- **Carbohydrates should provide 55% to 75% of total energy (calories).** Carbohydrates include foods such as breads, cereals, grains, pastas, vegetables, and fruits. Carbohydrates provide 4 calories per gram.
- **Proteins should provide 15% to 20% of total energy (calories).** Protein-rich foods include meats, fish, poultry, tofu, dairy foods, legumes, eggs, and nuts. Proteins provide 4 calories per gram.
- **Fats should provide 25% to 30% of total energy (calories).** Common fats include oils, butter, and margarine. Fat is also in many protein-rich foods. Fats provide 9 calories per gram.

Proteins: Athletes may need extra protein. Total needs rarely exceed 1 gram per pound of body weight per day. Keep in mind the following:

- Protein supplements have not been shown to enhance muscle development, strength, or endurance.
- Using amino acid supplements will not increase muscle mass or decrease body fat.
- Excess protein is either burned for energy, converted to fat, or excreted.

Fluids: Children and teenagers are at increased risk for dehydration (lack of adequate body water) and heat illness. Risk is greatest in hot, humid weather during long and intense activities. Use these guidelines to ensure that young athletes get enough fluids during physical activity:

- Never restrict fluids for any reason. Make sure that drinks are available at all times.
- **Plain water is the best drink for most athletes.** Carbonated drinks should not be used. Offering flavored water or an appropriate sport drink (check with your pediatrician) may encourage a young athlete to drink more.
- Athletes need to drink 4 to 8 ounces of water every 15 to 20 minutes during activity.
- Thirst is not a reliable guide to the need for water. An athlete may become dehydrated before he or she feels thirsty.
- Body weight should be about the same before and after activity.

Pre-exercise/Game Meal Guidelines: May include any reasonable foods that an athlete feels may help his or her performance and do not cause any complaints.

1 to 2 hours before	2 to 3 hours before	3 or more hours before
- fruit or vegetable juice, sport drink - fresh fruit (low fiber)	- fruit or vegetable juice, sport drink - fresh fruit (low fiber) - breads, bagels, crackers, English muffins	- fruit or vegetable juice, sport drink - fresh fruit (low fiber) - breads, bagels, crackers, English muffins - peanut butter, lean meat, low-fat cheese - low-fat yogurt (regular or frozen) - pasta with tomato sauce - cereal with low-fat milk

Nutrition Pearls:

1. Failing to take in enough fluids and calories may lead to early fatigue, irritability, or a sudden drop in performance.
2. Pre-event liquid meals are safe and effective. They provide fluids, are easy to digest, and empty quickly from the stomach (if they are not too concentrated).
3. Consuming carbohydrates within 30 minutes after intense exercise followed by more carbohydrates 2 hours later helps athletes better prepare for future activities.
4. Avoid supplements that may include unproven and dangerous ingredients.

Table reprinted with permission from American Academy of Orthopaedic Surgeons and American Academy of Pediatrics. *Care of the Young Athlete*. Sullivan JA, Anderson SJ, eds. Elk Grove Village, IL: American Academy of Pediatrics; 2000:89.

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