



Hughston Health Alert



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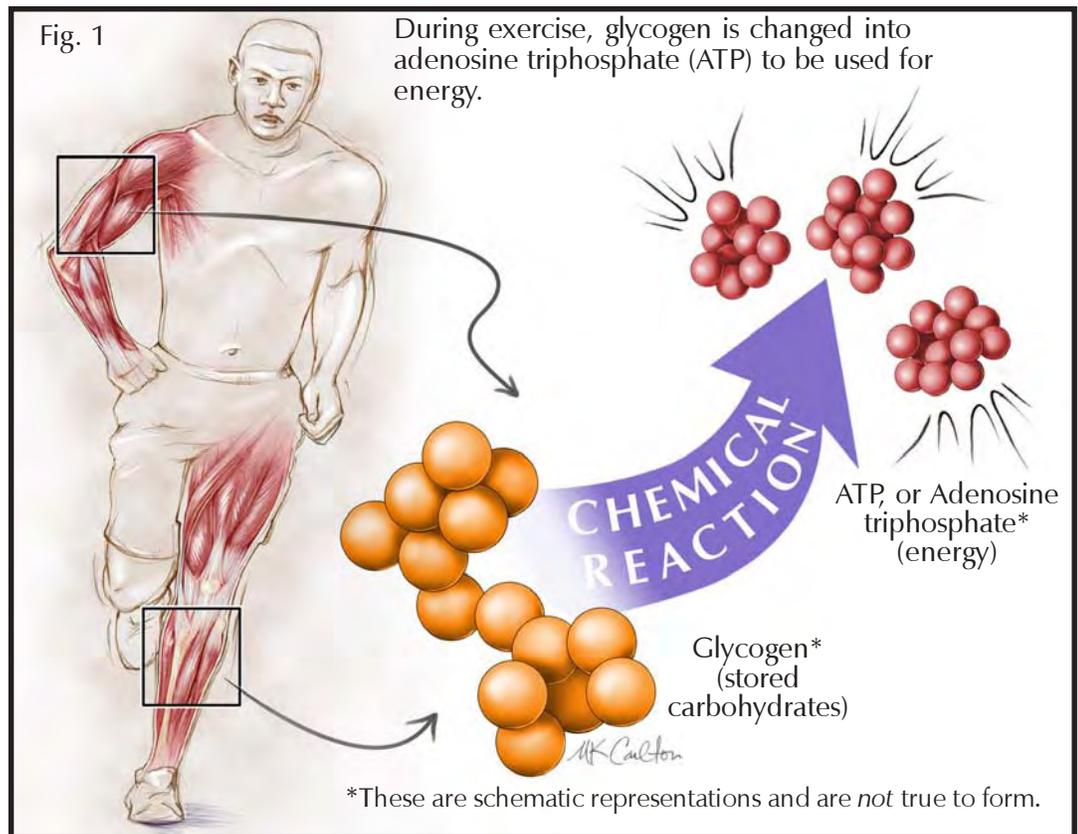
FALL, 2005

ACTIVE, HEALTHY ATHLETES

Carbohydrates for an Active Lifestyle

Your body's energy supply

For something so mundane, carbohydrates have received a lot of publicity lately. After all, what is a carbohydrate? Well, scientifically speaking, a carbohydrate is a long carbon chain with attached hydrogen. That certainly doesn't help, does it? Carbohydrates can be characterized as simple or complex and as refined (processed) or unrefined. As with other sources of nutrients, carbohydrates should be an essential part of your diet, especially if you are an active individual.



Inside This Issue:

- What is Reverse Anorexia?
- Blood Doping
- Anabolic Steroids
- Sports Nutrition for Athletes and the Rest of Us
- Bobbi A. Farber, MD

Carbohydrates are the main source of energy for the body. Carbohydrates are made up of starches and sugars that the body converts to glucose. Extra glucose is stored as glycogen in the muscles and liver and made available for activities that require endurance for activities lasting more than 1 hour or power for high intensity, short-lived activities. During exercise a chemical reaction occurs inside the muscles that changes the

stored glycogen into adenosine triphosphate or ATP (Fig. 1). Carbohydrate loading is often recommended for competitive athletes to perform their best during endurance activities.

Simple or complex

Foods that are immediate sources of energy—sugar, honey, and molasses—are examples of **simple carbohydrates**, sometimes called simple sugars. Simple carbohydrates

FOR A HEALTHIER LIFESTYLE

are also found in fruits and some vegetables. **Complex carbohydrates**, such as starches, provide vitamins, minerals, and fiber, as well as energy. Complex carbohydrates are found in whole grains (rice, pasta, cereal), vegetables, and legumes (beans and peas).

Refined or unrefined

Refined carbohydrates, such as those found in white rice, table sugar, and white bread, are changed from their natural state by processing **unrefined carbohydrates** that are found in brown rice, raw vegetables, fresh fruits, and whole grain breads. The process of refining strips the fiber, vitamins, and minerals from the food source. Therefore, unrefined carbohydrates are better because fiber has been shown to help decrease cholesterol, lower blood pressure, decrease body weight, and decrease the risk of heart attack (Fig. 2). Adults should have 10 grams of fiber in their diet each day.

Carbohydrates and competition

Carbohydrates can give athletes the winning edge. Without

adequate glycogen available, the body burns protein or fat for energy. Both of these sources are less efficient, produce less energy, and the process can put extra stress on the kidneys. Muscles loaded with glycogen work longer and harder during competition, thereby enhancing performance.

On the day of competition, or before vigorous exercise, avoid meals high in fat and protein. Eat a meal high in carbohydrates (70% to 80% carbohydrate) 3 to 4 hours before starting your competition. Eat easily digested food, nothing fried. Avoid sugary foods or drinks within the hour before the event and drink plenty of water—20 ounces 1 to 2 hours before the event and another 10 to 15 ounces 15 to 30 minutes before starting. During exercise lasting more than 1 hour, more carbohydrates should be eaten to replenish energy and delay fatigue.

Overall, carbohydrate-rich foods provide essential vitamins, minerals, and fiber and are the premier source of energy for an active lifestyle. They should compose 55% of the calories in a healthy diet. Choose complex, unrefined carbohydrates and drink plenty of water to have the energy to

exercise.

For more information about eating healthy and maintaining an active lifestyle, visit the American Heart Association Web site at <http://www.americanheart.org> or the Department of Health and Human Services, *HealthierUs.gov* Web site, <http://www.healthierus.gov/>.

Bobbi A. Farber, MD
Columbus, Georgia

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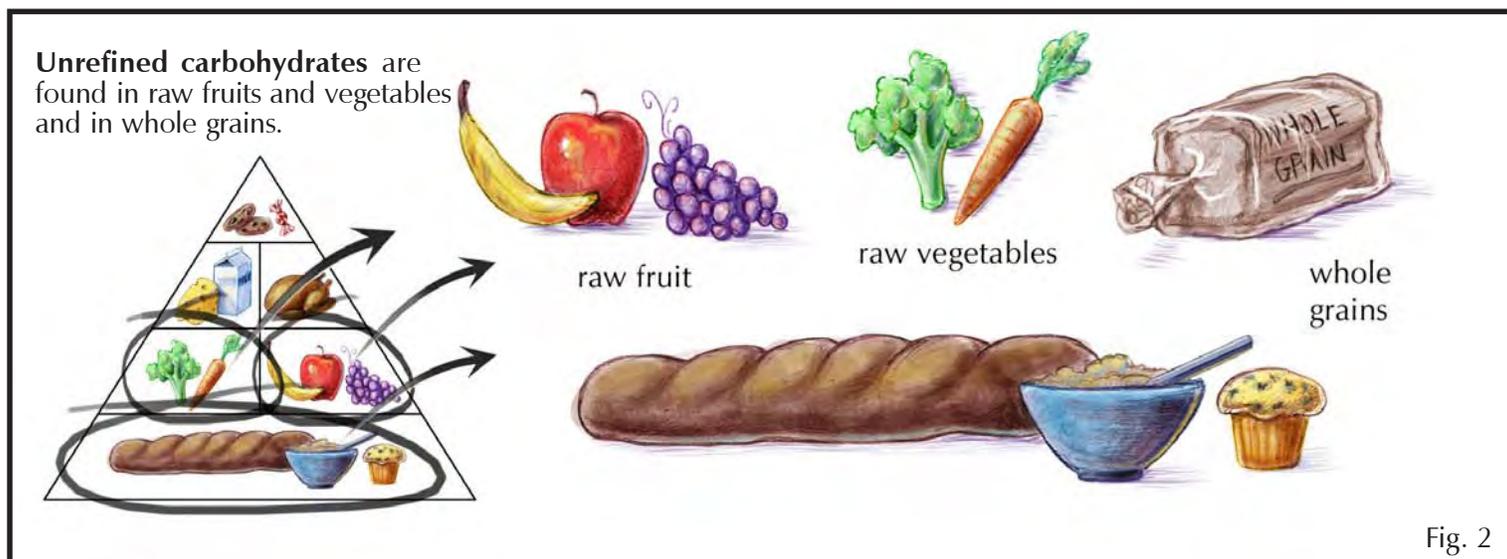
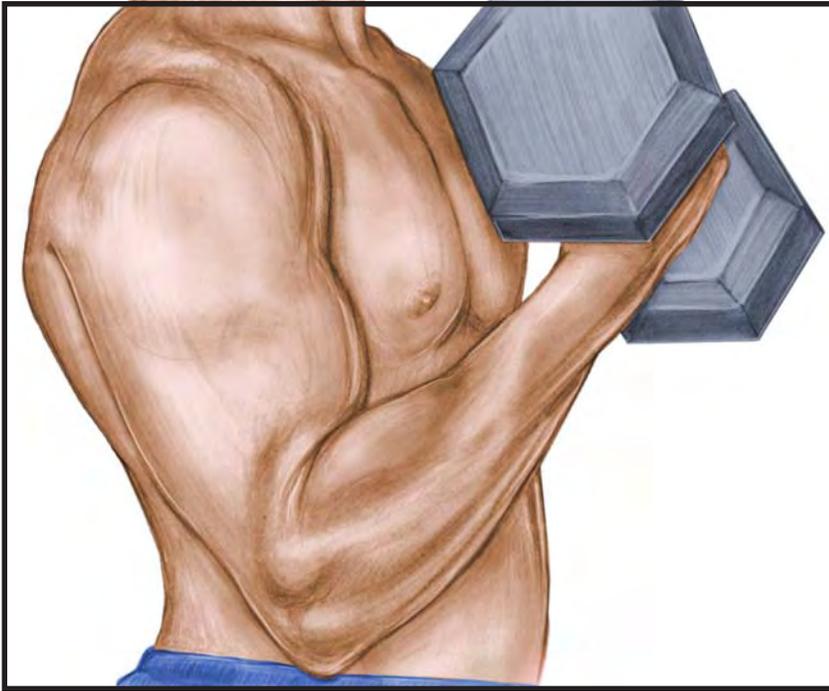


Fig. 2



What is Reverse Anorexia?

A body image in turmoil

Reverse anorexia (muscle dysmorphia) is a preoccupation with muscle development to the point it disrupts the person's lifestyle. A bodybuilder with reverse anorexia will not allow anything to interfere with his or her quest to build larger muscles. No other activities, including personal relationships, work, or school, are as important as his or her strength-training schedule.

The individual with reverse anorexia, tends to see himself or herself as small and undersized despite a large, muscular build. The self-perception becomes obsessive behavior as the person continuously strives for a bigger and better body. Both men and women suffer from reverse anorexia. However, the disorder is more common in men, most likely because our culture defines the ideal male as big and strong and the ideal woman as slender and petite.

The obsessive behavior can grow to the point the person works out and spends time at the gym at the risk of losing his or her job and damaging personal relationships. Often, the bodybuilder works out day after day despite injury and pain, and he or she may use steroids despite knowing the dangerous effects and risks involved.

Where can you get help?

When strength training becomes a

Symptoms of Reverse Anorexia

- Worrying about how the body looks and how it is perceived by others
- Checking the mirror and weighing often
- Obsessing over gym or workout schedules
- Abusing steroids
- Never satisfied with body size, always wanting bigger muscles
- Depression
- Becoming distressed if strength-training session missed

problem with relationships, work, or school, professional help is needed. Unfortunately, those who suffer from reverse anorexia usually do not think of themselves as ill. In fact, they are often content with their lives and are unable to see the problems arising from their obsessive behavior. They would rather continue to work out and strive for the perfect body, but unfortunately, with their illness, perfection will never be achieved.

Often, a family member, friend, or coach has to point out the obsessive behavior and encourage the person to seek help. To start, the individual should discuss the problem with his or her physician. The physician can work with other health-care professionals toward a treatment program to target the obsessive behavior and the depression that usually accompanies the disorder until the person's perception of self becomes more in line with reality.

For more information about reverse anorexia and other eating and exercising disorders go to www.ANRED.com.

*Dennise Brogdon, Medical Writer
Columbus, Georgia
Reviewed by: Bobbi A. Farber, MD*

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Blood Doping

Each summer brings our nation's annual short-lived interest in the grandest of all endurance events—the Tour de France. Because of the latest press coverage, any mention of the Tour will most likely bring up the subject of drug use and blood doping. The USA's own 2004 Olympic cycling gold medal winner, Tyler Hamilton, was accused of blood doping after last year's Vuelta a España race and has been suspended from international competition for 2 years. Although he maintains his innocence and has appealed the suspension, the incident has focused our attention on the subject of blood doping.

The catchall phrase, "blood doping" refers to any artificial and illegal

method an endurance athlete might use to increase the number of red blood cells in his or her bloodstream (Fig.1). Because red blood cells carry oxygen to the muscles, an increase in these cells would allow a high-level endurance athlete to perform at a higher level for a longer period of time, thereby boosting the athlete's performance.

Blood doping is usually accomplished using one of three methods: (1) injection of a synthetic hormone to stimulate the bone marrow to produce more red blood

cells; (2) transfusing another person's blood to build up the red blood cell count; or (3) banking one's own blood and re-infusing it at a later date, again to build up the red blood cell count.

The most prevalent and easily accomplished method of blood doping is through the injection of the

hormone erythropoietin (EPO). Used legitimately to help patients with anemia (deficiency of red blood cells), treatment with EPO can raise the

At press time, French newspapers have again reported allegations of blood doping against 7-time Tour de France winner Lance Armstrong. It should be noted that Armstrong legitimately used EPO to counter the harsh side effects of chemotherapy during his battle with cancer.

body's hematocrit (percentage of red blood cells) by up to 35% and can change the shape of red blood cells, allowing them to carry more oxygen.

Transfusion of another person's blood (homologous transfusion) or your own blood (autologous transfusion) can also be a very effective method of artificially boosting the blood's oxygen-carrying capacity. In both cases, the red blood cells are removed from the stored blood and given back to the athlete in a transfusion before a big competition. Effects from the transfusion can last for up to 6 weeks and can give the athlete up to a 30% increase in performance.

The governing bodies of endurance sports combat blood doping through both routine and random blood and urine testing. A urine test can detect EPO, and DNA tests can determine the presence of another person's blood in the athlete's bloodstream. Additionally, certain sports monitor athletes' blood hematocrit and do not allow an athlete with a hematocrit over 50 percent to participate in competition.

Testing is not foolproof, however. Traces of EPO are gone from the urine in 3 to 4 days, yet the effect

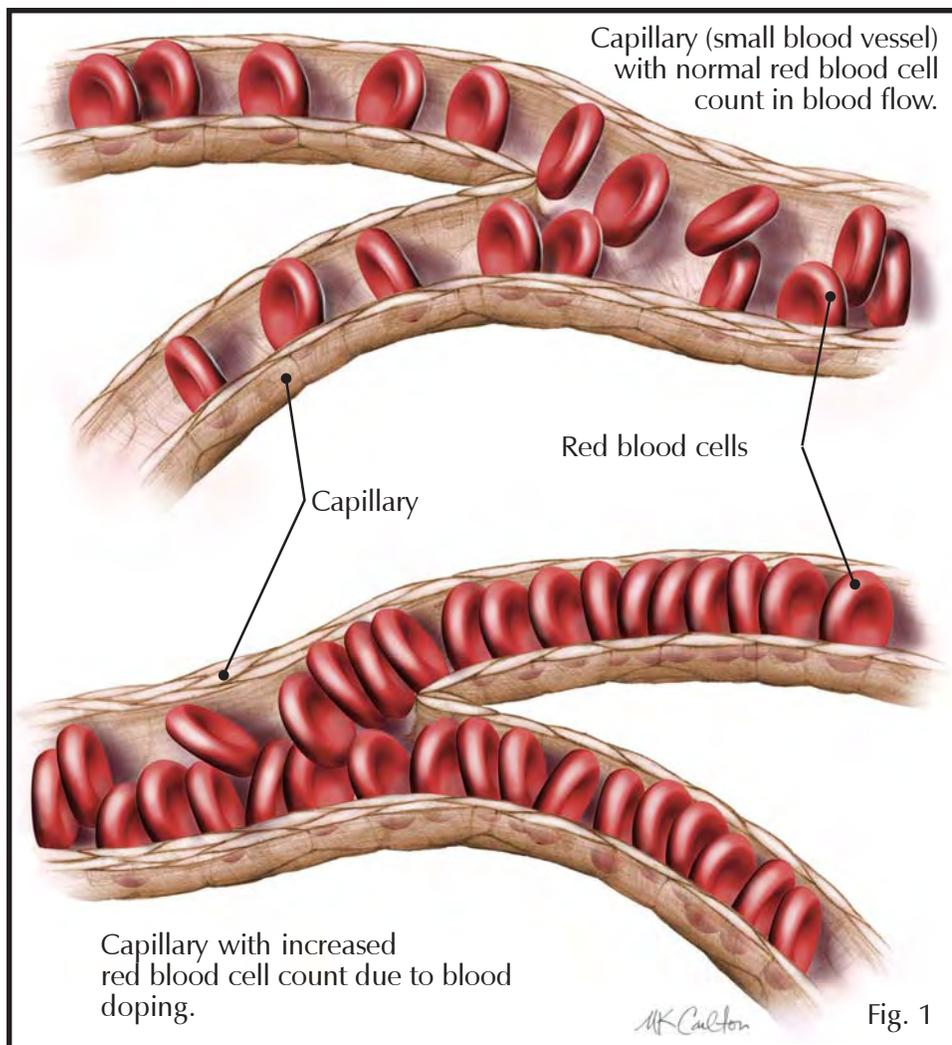


Fig. 1

can last up to 3 weeks. Although DNA testing is quite sensitive, it does not determine whether the athlete may have been formed from nonidentical twin embryos in the womb and would naturally carry two sets of DNA (termed a *tetragametic chimera*). In this case, an athlete could be falsely accused of transfusing someone else's blood. Training in a high altitude location where the air has less oxygen can naturally (and safely) boost the hematocrit up to 3 percentage points, and many high-level endurance athletes have a hematocrit that normally stays close to the 50 percent upper limit. By setting an arbitrary hematocrit limit an athlete could be falsely accused of blood doping.

Blood doping by any method is very dangerous. All blood doping methods increase the viscosity (thickness) of the blood, making the athlete's heart work harder and increasing the risk of death from blood clots or heart attacks. Homologous transfusions put the athlete at risk for transmissible diseases, such as hepatitis and HIV and can lead to transfusion-related symptoms, such as fever and anaphylactic shock. Autologous transfusions can be associated with bacterial infection and can also be responsible for an increase in blood clots.

Just like steroids in baseball, blood doping in endurance sports is simply cheating. Besides the unfair and undeserved advantage blood doping can give, there are many potentially fatal health consequences that can result from the illicit practice. Advances in testing technology combined with tighter regulations and stiffer penalties should work in tandem to reduce or eliminate blood doping from endurance sports.

David T. Curd, MS
Kennesaw, Georgia



Anabolic Steroids

Uses and abuses

Anabolic steroids are hormones that mimic the action of testosterone in the body (Fig. 1). The two main effects of anabolic steroids are androgenic and anabolic. The **androgenic** effect produces changes in the body such as facial hair and deepening of the voice. The **anabolic** effect promotes the retention of nitrogen and helps the growth and development of muscle tissue, which is the reason most athletes want to use steroids. Some athletes believe steroids give a winning edge by developing body power, strength, and decreasing recovery from heavy workouts.

Medical uses for anabolic steroids

Anabolic steroids are controlled substances with the potential for abuse and dependence. They are available legally as prescribed medications for treating specific anemia, osteoporosis, growth stimulation, gonadal dysfunction, and gynecological disorders. Anabolic steroids should not be confused with steroidal anti-inflammatory agents such as cortisone or corticosteroids because they are not the same.

Health hazards

Side effects for anabolic steroids range from mild to life-threatening (Fig. 2, pg. 6). The abuse of oral or injectable steroids is associated with higher risks for heart attacks,

strokes, and increased risk for liver problems. In adolescents, growth may be halted prematurely. Anabolic steroids can cause increased aggression, violence, and uncontrollable outbursts of anger, also known as "roid-rage." Additionally, steroid abusers who share needles are at risk for contracting HIV/AIDS, hepatitis, and bacterial endocarditis.

Detection and the law

Many athletes are not aware of the detectable effects of this group of drugs. Oral steroids are fat soluble steroids and can be detected in the urine for weeks to months after a person stops taking them. Steroids injected into muscle tissue can be detected for up to 6 months after the last use. The National Collegiate Athletic Association (NCAA) and the Olympics have banned anabolic

Examples of Anabolic Steroids

- Androstenedione
- Boldenone
- Clostebol
- Dihydrotestosterone (DHT)
- Epitestosterone
- Fluoxymesterone
- Methandienone
- Nandrolone
- Norethandrolone
- Oxandrolone
- Oxymesterone
- Stanozolol
- Testosterone

Fig. 1

Possible Side Effects of Steroid Use

- Cancer of the liver, prostate, or kidney
- Reduction of HDL (the good cholesterol)
- High blood pressure
- Enlarged prostate
- Liver damage
- Irrational behavior
- Erratic mood swings
- Aggressive behavior
- Depression
- Aching joints
- Injury to tendons, ligaments, and muscles
- Blood coagulation disorders
- Acne
- Swelling of feet and ankles
- Nosebleeds
- Increased fatty deposits
- Heart arrhythmias

Fig. 2

education, we can help to prevent anabolic steroid use.

Nancy Chaffee, RPh, MSHA
Columbus, Georgia

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steroids use, but Federal law goes even further.

According to the Controlled Substances Act passed in 1991, the possession or sale of anabolic steroids without a valid prescription is illegal. Simple possession of illicit steroids carries a maximum of 1 year in prison and a minimum \$1,000 fine for a first offense. The maximum penalty for trafficking is 5 years in prison for the first offense and a fine of \$250,000.

Education

The reported rate of anabolic steroid use in the United States is 6% to 11% among high school males and 2.5% of high school females. Education about the problems associated with anabolic steroids should start as early as the beginning of middle school. It is our responsibility as parents, teachers, school principals, coaches, and health-care professionals to alert children, adolescents, and adults about the importance of not taking anabolic steroids. Through

Sports Nutrition for Athletes and the Rest of Us

There's nothing magic about it

I wish I could give you a magic pill that would miraculously turn your body into what you want it to be. Unfortunately, no such pill exists. In reality, it takes a nutritious diet and exercise to help you maintain your weight, to build muscle mass, and to improve endurance.

Diet alone cannot create a strong, lean body. Strength, power, and endurance are the results of training. Your diet provides nutrients to fuel your body while you exercise. There's nothing magic about it. To achieve firm, tight muscles or to lose weight, you must follow a nutritious diet and burn a percentage of your caloric intake.

Diet must be individualized.

Your age, sex, physical condition, eating habits, and genetic background all contribute to your ability to burn fat. Your metabolic rate changes during your lifetime. For example, adolescents who are still growing have different nutritional needs from adults. Additionally, some people have a higher metabolism due to their genetic make-up and naturally burn more calories than others.

What's in a balanced diet?

You achieve weight control by balancing and controlling the amount of calories you take in and the amount of calories you burn each day. However, to achieve a balanced diet, you must consider the nutritional value of the calories, as well. Some foods supply proteins, some contain starches, and others provide certain vitamins and minerals. You should eat a variety of foods to get a good balance of the nutrients your body needs (Fig. 1, pg. 7). The nutrients—proteins, carbohydrates, fats, vitamins, minerals, and water—perform specific functions in your body. Your body needs all the nutrients, all the time—especially when you are active in a sport or if you exercise daily.

A vital fuel source, carbohydrates come from fruits, vegetables, cereals, rice, and breads. Carbohydrates have been getting a bad rap lately, but they are essential to a healthy diet. For an active individual, carbohydrates should make up approximately 70% of your diet. Your body turns them into glucose, which quickly burns off during exercise or activity. If you do not burn all the calories taken in as carbohydrates, your body will store a portion of the excess glucose in your muscle tissues as glycogen for later use. Often, an athlete will load up on carbohydrates before a competition so the body has plenty of glycogen

stored and ready for use.

Meats, fish, poultry, eggs, beans, nuts, and dairy products provide the body with proteins. Proteins are either burned or they are converted to fat and stored in your body. Proteins should make up about 15% of your daily diet.

Fats come from animal-derived foods, such as meats, eggs, milk, and from some vegetable products, such as corn oil. Fats should provide between 15% to 30% of your diet. Your body needs some fat for certain critical functions, and the body uses it when you have depleted your source of glucose. Otherwise, as you probably know, unused fat will be stored by your body.

Water is the most critical part of your diet because your body uses water for just about every function

Food Group	Major Nutrients	Daily Recommended Amounts for Teenage Athletes
Bread, cereal, rice and pasta	→ complex carbohydrates (starch and fiber), protein, B vitamins, and iron	→ 6 to 11 servings
Vegetables	→ vitamins and minerals	→ 3 to 5 servings
Fruits	→ vitamins and minerals	→ 2 to 4 servings
Milk, yogurt, and cheese	→ calcium, protein, vitamin A, and riboflavin	→ 3 servings
Meat, poultry, fish, dry beans, eggs and nuts	→ protein, thiamin, riboflavin, niacin, iron, and zinc	→ 2 to 3 servings

Fig. 1

(Fig. 2). Water lubricates your joints, cushions your organs, helps maintain your core temperature, and helps digest food and transport nutrients. Carbohydrates, proteins, and fats need water to function properly during digestion and the breakdown into smaller cellular bodies.

No magic in steroids and supplements

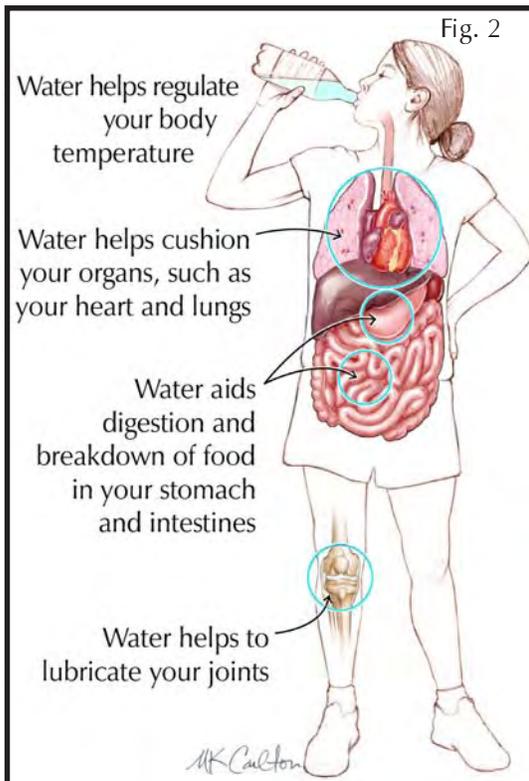
Don't look for steroids to be your magic pill, either. There are many steroids and supplements on the market today that claim to be "natural" or are marketed with the hyped-up notion that "natural" is safe. Consumers should know, however, supplements and other natural products do not undergo the same rigorous testing other medications do, and the manufacturer does not have to tell you about possible side effects. For example, the steroid testosterone, a hormone produced by the male body, affects reproduction, increases muscle mass, and affects other body changes males experience during adolescence. Some synthetic (man made) steroids mimic the effects of testosterone. A male's body regulates testosterone because too much can cause kidney and liver disease, atherosclerosis (plaque

buildup in an artery), and psychological problems. Additionally, if a male gets too much of the steroid, his body can stop making testosterone, which can lead to feminization, stunted growth, shrunken testicles, and enlarged breasts. Women, on the other hand, can develop male features that may not go away even after they stop taking the steroid. Unfortunately, possible side effects from most supplements are not explained to the consumer because the Food and Drug Administration does not regulate them.

Consult a professional

If you want to control your weight, build muscle mass, or increase endurance, you should contact a sports nutritionist. A sports nutritionist is usually a registered dietitian (RD) who specializes in nutrition for active people. A sports nutritionist or registered dietician will not promise a miraculous weight loss program; however, he or she will help you plan a healthy program balanced by diet and exercise. You can find a registered dietician in private practice or on staff at your local hospital or clinic.

Jesse Wright, MS, RD, LD
Columbus, Georgia



Bobbi A. Farber, MD, graduated from the University of Nebraska in Omaha, Nebraska. She went on to earn her medical degree at the University of Iowa College of Medicine. After completing her Orthopaedic residency at the University of Iowa, she started her practice in Columbus, Georgia.



Dr. Farber is certified by the American Board of Orthopaedic Surgeons and holds membership in many societies, including the American Medical Association, American Academy of orthopaedic Surgeons, Southern Medical Association, and the American College of Physician Executives.

Dr. Farber served as a board member on Physicians Group, Inc. and Quality Healthcare Partnership. She has also been Chief of Orthopaedics and Chief of Staff at St. Francis Hospital. She was honored as the Girl Scouts Woman of Achievement in 2005 and serves as Vice-President of Medical Affairs at St. Francis Hospital.

Dr. Farber and her husband, Dr. Thomas R. Walsh, have 5 children. When she is not seeing patients, Dr. Farber spends time with her children and is learning to play golf.

The *Hughston Health Alert* is a quarterly publication of the Hughston Foundation, Inc. The Foundation's mission is to help people of all ages attain the highest possible standards of musculoskeletal health, fitness, and athletic prowess. Information in the *Hughston Health Alert* reflects the experience and training of physicians at The Hughston Clinic, PC, of physical therapists and athletic trainers at Hughston Rehabilitation, of physicians who trained as residents and fellows under the auspices of the Hughston Foundation, Inc., and of research scientists and other professional staff at the Foundation. The information in the *Hughston Health Alert* is intended to supplement the advice of your personal physician and should not be relied on for the treatment of an individual's specific medical problems.

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