Cautioning patients about extreme diets

What do you say when patients inquire about highly unusual diets? Learn what to look for when evaluating diet safety and where to find Web resources for patient education.

When evaluating the safety and efficacy of any diet, clinicians should target 3 principle components: the quality of the content of the proposed eating plan, the quantity of food consumed, and the microbiological safety of the foods that are recommended as part of the diet. Foods can be considered safe if they have been prepared using proper sanitary practices, such as pasteurization. The dietary guidelines issued jointly by the US Department of Health and Human Services (DHHS) and the US Department of Agriculture (USDA) embody the federal government's current recommendations. Most dietitians believe that the more closely the content of an eating plan adheres to these guidelines, the safer it is. A new generation of researchers, however, advocates even stricter dietary vigilance, especially regarding meat and fat intake (see "USDA report: The health effects of popular diets," page 33).

OPTIMAL NUTRITION

The DHHS/USDA Dietary Guidelines are as neutral about specific eating patterns as possible. They offer 10 simple principles for diet and exercise that are compatible with long-term compliance:

- Aim for a healthy weight.
- Be physically active each day.
- Let the USDA Food Pyramid guide food choices.
- Choose a variety of grains daily, particularly whole grains.
- Choose a variety of fruits and vegetables daily.
- Keep food safe to eat: Keep hot foods hot and cold foods cold, and store leftovers at the appropriate temperature.
- Choose a diet that is low in saturated fat and cholesterol and moderate in total fat.
- Choose beverages and foods that are low in sugar to ensure moderate sugar intake.
- Choose foods that are low in sodium and prepare foods using less sodium.
- Consume alcoholic beverages in moderation, if at all.

In general, a nutritionally adequate diet includes a wide variety of foods and allows those who follow it to maintain an appropriate weight. It can readily be adapted to meet the needs of specific physiologic states, such as overweight or old age.

Foods from 4 basic groups are essential: whole grains

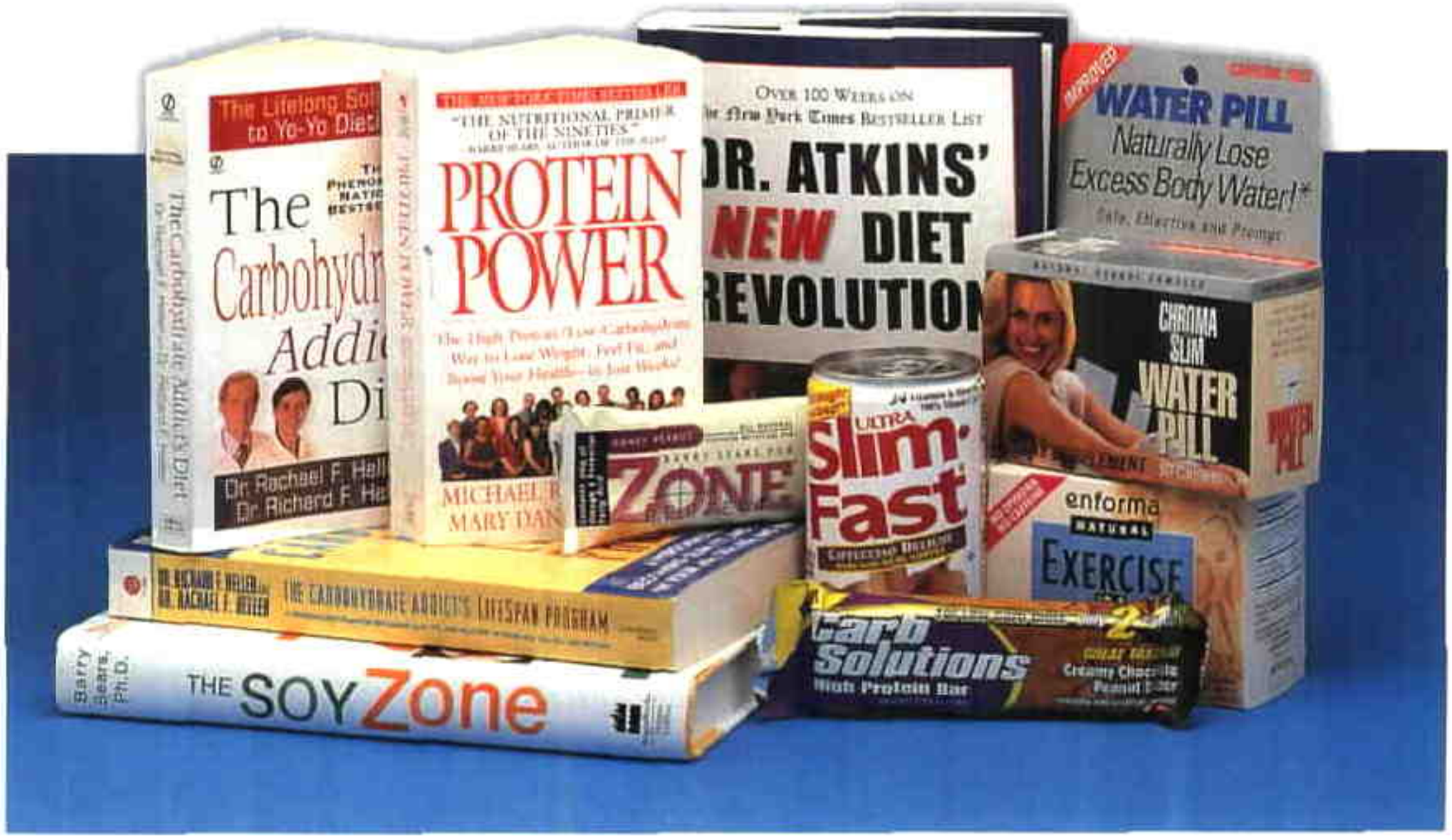
ARTICLE CONSULTANTS

NEAL D. BARNARD, MD, President, Physician's Committee for Responsible Medicine, Washington, DC.

ROBERT H. ECKEL, MD, Professor of Medicine, and of Physiology and Biophysics, Division of Endocrinology, Metabolism, and Diabetes; and Program Director, General Clinical Research Center, University of Colorado Health Sciences Center, Denver.

CUTBERTO GARZA, MD, Professor, Nutritional Sciences, Cornell University, Ithaca, NY.

This article was written by **Charlotte LoBuono** based on individual interviews with the article consultants.



(breads, cereal, rice, and pasta), vegetables, fruits, and lean meat and beans. Adequate vitamin B_{12} intake is also important. Fortified cereals or multivitamin supplements complete the eating plan. Fatty meats and added fats should be consumed sparingly.

TAKING A DIETARY HISTORY: WHAT TO LOOK FOR

A basic food history provides a quick, efficient assessment of the type of diet patients are following. The important questions to ask are

- How many servings of fruits and vegetables do you eat per day? (A satisfactory answer would be 3 or more of each.)
- How many servings of whole grains do you eat per day? (A satisfactory answer would be 6 or more.)

By following these dietary guidelines (3 or more servings of fruit and vegetables per day and 6 or more servings of whole grains per day), most people can avoid overindulging in foods with little or no nutritional value. It is also important to review patient intake of foods that can increase the risk of cardiovascular disease and obesity. These include energy-dense foods that are high in sugar, saturated fat, and cholesterol.

WEIGHT-LOSS DIETS

Because the success rate of permanent weight loss is less than 10%, prevention of obesity is crucial. Physicians can play a pivotal role by emphasizing the importance of diet and exercise in obesity prevention (see "Web resources for patient education," page 34). Most of the diets discussed in this article restrict overall energy intake by restricting the intake of a particular food or food group. Although weight loss will result, the diets are difficult to adhere to for an extended period. In addition, an effec-

PHOTO: STEVE MUNZ

This article at a glance

Introduction

- The dietary guidelines issued jointly by the US Department of Health and Human Services and the US Department of Agriculture provide useful guidance for evaluating the safety of diets.

Optimal nutrition

- In general, a nutritionally adequate diet includes a variety of foods, is compatible with long-term compliance, and allows those who follow it to maintain an appropriate weight.
- Foods from 4 basic groups are essential: whole grains, vegetables, fruits, and lean meat and beans.

Taking a dietary history: What to look for

- A basic food history provides a quick, efficient assessment of the type of diet patients are following.
- It is also important to review patient intake of foods that can increase the risk of cardiovascular disease and obesity.

Weight-loss diets

- Physicians should emphasize that exercise and diet interact to maintain health and control weight.
- Popular diets are often based on unsubstantiated theories.
- Extremely hypocaloric diets are neither safe nor useful.

Vegetarian diets

- The vegetarian approach to eating is appropriate for most life stages and can also benefit competitive athletes.
- Patients following vegan and ovolactovegetarian diets should include a source of vitamin B_{12}.

"Cautioning patients about extreme diets," *Patient Care*, August 15, 2001.

tive weight-loss or weight-maintenance plan should be followed in conjunction with an exercise regimen.

Diets in the news

Patients are most likely to ask about diets that have recently received media attention. Diets that are perceived as quick fixes for weight management problems are always popular. These programs rarely work over the long term, however, and patients should be discouraged from crash-dieting and using other extreme measures to lose weight (see Table 1, page 39).

Clinicians should be aware of which popular diets are based on theories that are scientifically unsubstantiated.

The Zone Diet (http://www.zoneperfect.com) is based on the principle that one can burn excess fat and increase energy by maintaining insulin levels within a certain range—an assumption that has not been proved. The 2 fundamental tenets of this diet are that the body must receive an adequate supply of low-fat protein at each meal and that macronutrients (carbohydrates, proteins, and fats) should be consumed in a ratio of 40-30-30, respectively, which the author of the Zone Diet books, Barry Sears, PhD, considers to be the caloric ratio that promotes optimal functioning of the human body. It is believed that consuming macronutrients in this ratio allows for precise glucose control.

Macronutrients are consumed in units called blocks in a 1:1 ratio at every meal or snack. Each meal consists of 3 blocks of each macronutrient, and each snack consists of 1 block of each macronutrient. One carbohydrate unit consists of 9 g of carbohydrate, one protein block consists of 7 g of protein, and one fat unit consists of 1.5 g of fat (primarily monounsaturated fats such as olive oil, canola oil, and those found in avocados).

Carbohydrates consumed when following the Zone Diet should have a low glycemic index, so that they raise blood glucose levels slowly, producing a moderate insulin response. Examples of carbohydrates that are considered favorable to the Zone Diet are found in vegetables such as broccoli, cauliflower, and tomatoes, and fruits such as oranges, apples, and apricots. Examples of acceptable protein-rich foods include 1 oz of skinless chicken breast, 1 oz of tuna, or 2 egg whites.

The consumption of omega-6 fatty acids is

USDA report: The health effects of popular diets

In January 2001, the US Department of Agriculture (USDA) released a report detailing the health effects of popular weight-loss diets. The USDA reviewed the scientific literature on these diets and explored the following questions:

- Are the diets effective?
- Can people who follow these diets maintain their weight loss?
- Does the recommended food composition have an impact on the type of weight lost (fat versus lean body mass) and metabolic parameters such as BP and lipid levels?
- Do these eating plans bring hunger and appetite under control?
- Do they reduce the risk of chronic diseases such as diabetes and heart disease?
- How do these diets affect insulin, leptin, and other long-term hormonal regulators of energy intake and expenditure?

High-fat, low-carbohydrate diets may cause people to lose weight because overall caloric intake is decreased. Because low-fat and very-low-fat diets are naturally high in fiber and low in energy density, those who follow them lose weight because they consume fewer calories.

Although the macronutrient composition of the diet does not appear to influence any changes in body composition, low-carbohydrate diets cause the loss of more body water than body fat in the short term. This water weight is regained when the diet is discontinued. Exercise should be encouraged because it augments the effects of diet on body composition.

According to the USDA report, high-fat, low-carbohydrate diets are nutritionally inadequate and are low in micronutrients including magnesium, iron, zinc, calcium, and potassium. They are also deficient in vitamins A, E, B_1, B_6, and folate. These eating plans are low in fiber but high in saturated fat and cholesterol. A moderate-fat diet is the optimal way to ensure an adequate intake of nutrients. Poor food choices, however, may result in nutrient deficiencies, such as those of calcium and zinc, regardless of the macronutrient composition.

The macronutrient and fatty acid composition of diets can influence blood lipid levels. LDL cholesterol decreases significantly when an eating plan is low in saturated fatty acids. Dietary fat content and duration of calorie restriction influence changes in HDL cholesterol (HDL-C). Although very-low-fat, high-carbohydrate diets cause an increase in plasma triglyceride levels and a decrease in HDL-C levels over the short term, high-fiber foods such as legumes do not result in hypertriglyceridemia. It is appropriate to incorporate these foods into a moderate-fat diet. Glycemic control is improved by dietary energy restriction, independent of diet composition. The decrease in BP that accompanies weight loss is also independent of the components of an eating regimen.

Long-term regulation of body weight is apparently controlled by insulin and leptin, which in turn are influenced by a diet's macronutrient content. Psychological issues, such as group support and coping with emotional eating, may have additional influence over consistent diet compliance. Overall success may be a function of social support, direct confrontation of emotional and physical problems, and the implementation of personally developed strategies for achieving and maintaining a healthy weight.

Source: The Great Nutrition Debate Executive Summary. Available at: http://www.usda.gov/news/releases/2001/01/whitepaperexe.htm. Accessed April 26, 2001.

discouraged because the author believes that metabolizing them may be deleterious. In fact, omega-6 fatty acids are polyunsaturated and, in reasonable amounts, are safe to incorporate into a healthy, balanced diet.

The Zone Diet is also high in protein, which, in excess, depletes calcium and strains the kidneys. The protein requirement is generally 20% to 50% above normally recommended levels.

The Soy Zone Diet allows vegetarians to follow the Zone Diet by substituting soy protein for animal protein. This version of the Zone is based on 6 basic rules:

- Maintain a balance of protein and carbohydrate.
- Choose low-density carbohydrates (such as those in fruits and vegetables).
- Keep portions moderate.
- Balance carbohydrate and protein intake at every meal.
- Consume Soy Zone meals and snacks no more than 5 waking hours apart.

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Web resources for patient education

American Cancer Society (ACS)
(800) ACS-2345
Web site: http://www.cancer.org
The ACS Web site has an area dedicated to nutrition and prevention (http://www2.cancer.org/prevention/NutritionandPrevention.cfm) that discusses topics such as the importance of nutrition in preventing cancer and dietary factors that affect cancer risk. This area also features a page containing answers to common questions about the relationship of specific foods to cancer risk. The discussion of the ACS dietary guidelines found in this area is intended for both physicians and patients.

American Dietetic Association (ADA)
Headquarters
216 W Jackson Blvd
Chicago, IL 60606-6995
(800) 366-1655

Washington, DC office
1120 Connecticut Ave, NW, Suite 480
Washington, DC 20036
(202) 775-8277
Web site: http://www.eatright.org
This site has an area entitled "Healthy Lifestyle," which features lifestyle tips, daily nutrition tips, and a nutrition reading list. Patients can also use the Web site to locate a dietitian in their area whose expertise matches their individual needs.

American Heart Association (AHA)
American Heart Association National Center
7272 Greenville Ave
Dallas, TX 75231
Customer heart and stroke information:
(800) AHA-USA1
Web sites: http://www.americanheart.org/catalog/Health_catpage4.html, http://www.deliciousdecisions.org
These sites give comprehensive information about the standard diets for those with or at risk of heart disease, including recipes and tips for eating out. The sites feature links to the AHA dietary recommendations on topics such as menu planning and weight management.

US Department of Agriculture (USDA) Center for Nutrition Policy and Promotion (CNPP)
Web site: http://www.usda.gov/cnpp/index.htm
The USDA/Department of Health and Human Services dietary guidelines are intended for patients and physicians alike. Each of the 10 principles on which they are based are explained in basic terms. To access the guidelines, log on to the CNPP Web page and click on the link for "Dietary Guidelines for Americans, 2000, 5th edition." Consumer pamphlets on using the guidelines are also available. Call the government printing office at (202) 512-1800 to purchase copies in lots of 50. The USDA CNPP Web site also has a section where patients can assess the quality of their diet.

• Choose foods that reflect eating preferences.

Dr Sears recommends daily supplementation with long-chain omega-3 fatty acids, vitamin E, and vitamin B_{12}. Aerobic exercise is encouraged for those who are following the Zone Diet because it reduces insulin levels and maximizes fat metabolism. Anaerobic exercise is also recommended because it causes the release of human growth hormone, which repairs microdamage to muscle tissue—a process that utilizes fat for fuel.

The Atkins Diet (http://www.atkinscenter.com) is a high-fat, low-carbohydrate diet, which may put those who follow it at risk for heart disease and progressive atherosclerosis—particularly patients with cardiovascular risk factors.* According to one study, the condition of people at risk of heart disease deteriorates rather than improves on a high-protein diet.[1] The Atkins Diet may cause weight loss, but it is deficient in the fruits and vegetables that provide fiber and vitamin C.

This program consists of 4 phases designed to follow one another consecutively. The first phase is known as induction and is characterized by specific restrictions.

• No more than 20 g/d of carbohydrates in the form of salad and vegetables are permitted, al-

*See "Advising patients about low-carbohydrate diets," *Patient Care*, June 15, 2001, page 76.

though pure proteins and pure fats are allowed.
• No fruit, grains, breads, starchy vegetables, or dairy products other than cream, cheese, or butter are allowed.

The purpose of this phase is to induce ketosis, ostensibly so that the body will rapidly metabolize fat. This phase is intended to last for 2 weeks, although those who have a significant amount of weight to lose can stay on this phase longer.

The following features are unique to the second phase of the Atkins diet, which is referred to as ongoing weight loss (OWL):
• Daily carbohydrate intake is increased by 5 g each week. This should continue until the critical carbohydrate level for losing—the daily carbohydrate intake level at which a person stops losing weight—is identified.
• Some 5-g increments could include half of an avocado or one half of a cup of green beans. Such a gradual increase is intended to keep the body in ketosis.
• This phase can be followed until goal weight is almost reached (within 5 or 10 lb).

Premaintenance is the third phase of the diet. During this phase
• Daily carbohydrate intake is increased by 10 g each week above what was previously consumed on OWL.
• Foods such as baked potatoes and certain fruits (apples, bananas, grapefruits) are now permitted.

Maintenance, the fourth phase, begins when goal weight is reached. Even during the maintenance phase, however, carbohydrate intake is still fairly restricted—at 40 to 60 g/d. Patients must identify their personal critical carbohydrate level for maintenance, the daily carbohydrate intake level at which the person neither gains nor loses.

Nutritional supplements are also a part of the Atkins program. Recommended basic supplementation consists of 300 mcg/d of chromium, 6 capsules daily of essential oils (2 capsules of fish oil, 2 of borage oil, and 2 of flaxseed oil), and, if they are found to be helpful, L-carnitine, coenzyme Q_{10}, and pyridoxine alpha-ketoglutarate. Dr Atkins also recommends a basic dieter's formula supplement that he developed, containing approximately 30 different vitamins and minerals.

TABLE 1
Warning signs of dangerous diets

Requires intake of specific bars, pills, supplements, powdered food, or frozen meals
High in cholesterol and fat
Based on highly processed foods
Intended to be of only a few weeks' duration
Recommended foods do not reflect the guidelines espoused in the diet
Promises fast, unrealistic results
Recommended caloric intake is <10 times the person's ideal weight in pounds

The Atkins Diet is based on the putative benefit of suppressing insulin release. Drastically reducing carbohydrate ingestion theoretically prevents high circulating levels of insulin, which slows down or stops fat metabolism. Excluding carbohydrates from the diet would thus promote the burning of body fat. But protein ingestion also stimulates insulin release. It is also worth noting that Asians have lower rates of heart disease and obesity than Americans do; yet Asian diets are traditionally very high in complex carbohydrates.

Protein-rich diets such as the Atkins Diet are associated with nephropathy and low calcium levels. High-protein diets also cause hypercalciuria, increasing the risk of osteoporosis. Increasing calcium consumption is ineffective in countering this calcium loss. Those who follow the Atkins Diet are at risk for decreased glucose, insulin, and lipid levels over the short term. They

should have their serum lipid, uric acid, and potassium levels monitored regularly, because they are also at risk for dehydration, gallbladder disease, and constipation.

Dr Atkins encourages persons who adhere to his program to exercise for several reasons, including the claim that exercise reduces insulin output. In his book *Dr Atkins' New Diet Revolution*, he offers commonsense advice such as fitting exercise into one's daily schedule and starting an exercise plan slowly.

Sugar Busters! (http://www.sugarbusters.com) is another popular diet based on the premise that sugar is toxic to the system and causes fat accumulation. Sugar causes the pancreas to release insulin, which in turn causes the body to store excess sugar as fat. Insulin also inhibits the mobilization of previously stored fat and signals the liver to produce cholesterol. Conversely, glucagon is released by the pancreas following a protein-rich meal. This hormone promotes the mobilization of previously stored fat.

Each particular food causes a characteristic peak in the blood glucose level when consumed (the glycemic potential). The glycemic index is a numeric value that indicates the glycemic potential of a particular food. Specifically, it represents the area under a curve depicting the rise in blood glucose levels over a period of time. This eating plan advocates the consumption of foods with a low glycemic index, which release their sugars slowly, to avoid elevated insulin levels. Examples of such foods include unrefined carbohydrates such as high-fiber vegetables, whole grains (with their fiber), and fruits. Lean meats (as a source of glucagon-stimulating protein) and primarily unsaturated fats (in moderation) are also necessary for nutritional well-being and to modulate the insulin-glucagon relationship.

The position that this diet takes regarding the toxicity of sugar is unproven, however. Americans are overweight because they consume more calories then they expend, not because of the macronutrient composition of their diet. Although this diet does allow for nutritious food choices, it may be high in saturated fat. It should also be noted that the authors claim that the Sugar Busters! diet is beneficial for people who have diabetes because it reduces blood sugar levels.

Diets with an intake of less than 600 kcal/d do not serve any therapeutic purpose and are difficult to follow.

The Carbohydrate Addict's Diet espouses the theory that carbohydrate-rich foods are as addictive as drugs. According to the authors, consuming foods that are rich in carbohydrates causes the overrelease of insulin, which results in a powerful impulse to overeat. The excess food consumed is then stored as fat. This theory is also unproven. No data show that carbohydrate addiction occurs.

According to the authors of *The Carbohydrate Addict's Diet*, there are 3 progressive levels of addiction to carbohydrates. Addiction level 1 is characterized by

- An addiction to carbohydrates that may be masked by a desire for many different foods
- Satiety that is the result of eating great quantities of many different foods as part of what the person believes to be a well-balanced diet.

At addiction level 2

- The desire for protein, fruits, and vegetables diminishes, and the craving for starches, includ-

ing pasta and breads, becomes stronger.
• High-carbohydrate snack foods such as popcorn and pretzels are also found to be more satisfying.
• Recurring exhaustion, especially after meals and in the midafternoon, is characteristic. People become increasingly concerned at this level about issues related to weight and weight loss.

For persons who reach addiction level 3
• The craving for sweets is particularly strong, and snacks and desserts are the foods of choice.
• Eating when one is not hungry is common. Periods of eating distinct from periods of fasting disappear; most meals are forsaken in favor of continuous snacking.

The authors define carbohydrate-rich foods as those containing more than 4 g of carbohydrate per serving. This plan restricts carbohydrate consumption to a daily Reward Meal, to be consumed over a 1-hour period. The authors surmise that by limiting the time during which foods containing carbohydrates are consumed, insulin production is also limited and can thus be controlled. According to the authors, when the body has been deprived of insulin-inducing carbohydrates for 2 consecutive meals, it does not crave carbohydrates at the third meal and will release far less insulin. This decreased insulin release results in reduced fat storage and increased fat burning. The food choices allowed on this diet may result in an eating plan that is high in saturated fat and low in vitamins C and E.

The authors recommend a moderate level of physical activity but state that it is not an important adjunct to the diet's weight-loss component. They believe that it is a return to normal insulin levels that promotes weight loss in persons who are addicted to carbohydrates.

Very-low-calorie diets

According to the consultants for this article, extremely hypocaloric diets—those with an intake of less than 600 kcal/d—do not serve any therapeutic purpose and are difficult to follow for an extended period because the energy deficit that accumulates is unsustainable and dangerous. These diets generally are deficient in essential nutrients and are associated with the risk of certain conditions, such as gallstones.

Diet aids and liquid diets

OTC appetite suppressants and liquid meal replacements are not substitutes for a healthy diet and should not replace nutritious foods. Meal replacement drinks may fit into the overall diet plan, particularly as a way to avoid overeating, however. One method of avoiding excess food consumption is to drink one of these products shortly before a meal. Their use does not constitute a permanent change in eating patterns. Thus, once patients revert to their former dietary habits, they usually regain any lost weight.

OTC appetite suppressants may not have been adequately tested prior to marketing and are usually ineffective. They may even be dangerous. Phenylpropanolamine, for example, a common ingredient in OTC decongestants and appetite suppressants, has been associated with an increased risk of hemorrhagic stroke. On November 6, 2000, the FDA issued a public health advisory alerting consumers to the dangers of phenylpropanolamine and ordered it removed from all products.

VEGETARIAN DIETS

In its position paper on vegetarian diets, the American Dietetic Association (ADA) stated that carefully planned vegetarian eating patterns were beneficial to the health of those who followed them and were nutritionally adequate.[2] The vegetarian approach to eating is appropriate for most life stages, including childhood, pregnancy, and lactation. It can also benefit competitive athletes.

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An important issue for those following vegan diets (including vegetable products only) and ovolactovegetarian diets (including eggs and dairy products, but excluding meat, fish, or fowl) is ensuring a reliable and adequate source of vitamin B_{12}. Generally, however, such diets are more nutritious than typical omnivorous diets. Vegetarian diets are probably safe over the long term if people adhere to the following ADA guidelines:

- Select a variety of foods, including a selection of fruits and vegetables.
- Eat whole, unrefined foods, and forgo refined, sweetened foods.
- Choose lower fat versions of animal-derived foods, such as dairy products and eggs.
- Incorporate a source of vitamin D (if sun exposure is limited) and a source of vitamin B_{12}.
- Eat a variety of soy-based foods in addition to whole grains, beans, and vegetables to provide sufficient amounts of protein.

Beans and vegetables are rich in B-complex vitamins, with the exception of vitamin B_{12}, which is available through fortified cereals and nondairy milks, such as soy milk. Fortified juices are a convenient calcium source. □

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► *Patient information: Understanding and using the USDA dietary guidelines*

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