

Nutrition: Wellness and Disease • part 2

# Nutrition and disease

## LEARNING OBJECTIVES

- **Describe** the symptoms, effects and treatment of anorexia and bulimia nervosa.
- **Explain** the role of nutrition in cardiovascular disease.
- **Describe** the importance of good nutrition in preventing and treating diabetes, cancer and osteoporosis.
- **Explain** the role of nutrition in treating certain gastrointestinal and liver diseases.
- **Explain** the role of diet in migraine headaches.

*This second article in a three-part series focuses on the role of nutrition in several diseases and disorders, including eating disorders, cardiovascular disease, diabetes mellitus, cancer risk, osteoporosis, gastrointestinal disease, liver disease and migraine headaches.*

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**D**eath rates from chronic, diet-related diseases such as heart disease, cancer and hypertension have been rising dramatically in the United States, in spite of the abundance and variety of foods available. This article discusses the role of nutrition in sev-

eral major diseases and conditions.

### Eating disorders

People with the eating disorders anorexia nervosa and bulimia nervosa extend their concern about weight to a neurotic extreme. Those with anorexia starve themselves intentionally. Those with bulimia, a related disorder, binge on food and then try to eliminate it through vomiting, excessive exercise, and the abuse of medications such as cathartics/laxatives and emetics. The two conditions have many features in common and often coexist in the same individual. Bulimia is more prevalent among females and persons in weight-related occupations, such as models (both male and female), ballet dancers, gymnasts, wrestlers and jockeys. Females with anorexia outnumber males 10 to 20 times.

People who suffer from anorexia and bulimia may experience severe guilt and shame, menstrual disorders, weakness, bone mineral loss, chemical imbalances, and malnutrition. They also experience illnesses such as infection and kidney or cardiopulmonary impairment. Some anorexia sufferers may even die as a result of these conditions.

The successful treatment of anorexia must address both psychological and physical concerns. In many cases, anorexics should be hospitalized during treatment to ensure compliance with therapy, preferably in a psychiatric unit that specializes in treating eating disorders.

Most cases of bulimia are not severe and

may resolve without formal treatment. When treatment is indicated, it is usually on an outpatient basis. Drugs that have proven effective in treating bulimia include tricyclic antidepressants, trazodone, fluoxetine and monoamine oxidase inhibitors.

### Cardiovascular disease

Cardiovascular disease is the leading cause of death in the United States. Every day, thousands of people suffer heart attacks (myocardial infarction) and strokes, while more than a million others continue to suffer from various forms of rheumatic and congestive heart disease.

**Coronary heart disease.** Coronary heart disease (CHD), also known as coronary artery disease, is the major cause of heart attacks. Atherosclerosis, a primary contributing factor in CHD, involves a progressive narrowing of the major blood vessels due to a buildup of fatty plaque (atheromas) along the artery walls. Smoking and some disease states, particularly high blood pressure and diabetes, may contribute to the disease.

The National Cholesterol Education Program recommends the following measures for patients with elevated cholesterol and/or CHD risk factors:

- Reduced intake of saturated fats and cholesterol.
- Therapeutic dietary options to enhance lowering of low-density lipoprotein cholesterol (plant stanols/sterols and increased soluble fiber).
- Weight reduction.

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- Increased regular physical activity.

Growing evidence suggests that consuming five or more servings of fruits and vegetables per day reduces the risk of CHD and stroke. Other suggested dietary components include folate and antioxidant vitamins.

**Hypertension.** Hypertension, or high blood pressure, accelerates the process of atherosclerosis, which in turn may affect the coronary arteries and cause a heart attack. In people with high blood pressure, the heart is working harder to pump the same amount of blood. In general, the diagnosis of hypertension is made if the blood pressure is consistently 140/90 mm Hg or higher. In the majority of cases, the precise cause of high blood pressure is unknown.

Lifestyle changes, such as dietary adjustments, weight loss and exercise, are usually preferred over long-term use of antihypertensive drugs in treating hypertension. Dietary treatments focus on reducing sodium, which alone can decrease blood pressure almost immediately in some people. Sodium causes the body to retain fluids, and thus, in many people, it is a factor in causing high blood pressure. However, in many cases, a combination of therapies is required, including medications.

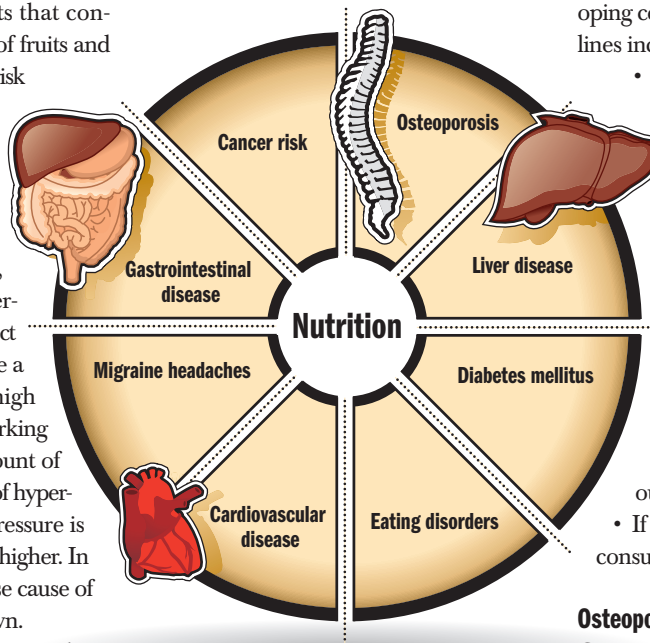
To combat hypertension, the National Heart, Lung and Blood Institute recommends losing excess weight, exercising regularly, moderating alcohol consumption, and eating a diet rich in fruits, vegetables and low-fat dairy foods.

### Diabetes mellitus

About one in ten people with diabetes has type 1 (or insulin-dependent) diabetes mellitus, in which the pancreas usually produces little or no insulin, and insulin is required for treatment.

The rest of the population with diabetes has type 2 (or non-insulin-dependent) diabetes mellitus, caused by either a deficiency of insulin or the body's resistance to it. As a result, greater amounts of insulin are needed to maintain normal amounts of glu-

### The role of nutrition in disease



cose in the blood. Many people with type 2 diabetes also require oral hypoglycemic agents, and most are overweight or obese. Obesity increases the body's need for insulin, and the pancreas is unable to keep up with the demand. As a result, controlling the blood sugar concentration becomes even more difficult, and the likelihood of serious complications increases.

For many people with type 2 diabetes, dietary therapy involves weight reduction for the overweight individual and the establishment of regular eating patterns for the lean patient with an appropriate weight. Diet helps control the blood glucose concentration and helps maintain or reduce weight. People with diabetes must carefully regulate their consumption of carbohydrates, fats, cholesterol and proteins. They should avoid simple sugars, such as those in candies, cookies and sugary drinks. They should include fiber-rich foods, such as whole-grain breads, fruits and vegetables, as well as lean meats and low-fat dairy products, in their diet.

### Cancer risk

The American Cancer Society has developed nutrition and physical activity guide-

lines to help people reduce the risk of developing certain kinds of cancer. These guidelines include:

- Eat a variety of healthy foods, with an emphasis on plant sources.
  - Choose whole grains in preference to processed (refined) grains and sugars.
- Limit consumption of red meats, especially those that are processed or high in fat.
  - Choose foods that help maintain a healthy weight.
  - Adopt a physically active lifestyle.
- Maintain a healthy weight throughout life.
- If you drink alcoholic beverages, limit consumption.

### Osteoporosis

Osteoporosis results from the loss of bone mineral and protein matrix from the bones. A clear link has been established between the development of osteoporosis and a diet deficient in calcium.

Osteoporosis occurs in far more women than men, and in some women more than others. Because osteoporosis occurs after menopause in women, it may be related to the lack of the female sex hormones estrogen and progesterone. On the other hand, poor nutrition is a more likely factor, especially inadequate calcium and/or protein intakes over the years, or a predisposition to malabsorption of calcium. The general practice is to increase the intake of calcium and vitamin D in postmenopausal women – calcium to at least 1,000 mg a day, and preferably to 1,500 mg a day, and vitamin D to between 400 IU and 800 IU daily.

Milk and other dairy products are the main source of calcium in the diet. Dairy products are important for the growing bones of children and adolescents as well as the bone-forming cells of adults. Regular daily consumption of at least two cups of skim or low-fat milk is essential for adults who want to keep their bones strong and prevent osteoporosis. Other sources of calcium in the diet include fortified cereals,

certain fish (such as salmon and sardines) and dark, leafy vegetables.

### Gastrointestinal disease

Gastrointestinal problems, such as peptic ulcers and inflammatory bowel disease, affect the body's ability to obtain nutrients from food to provide energy and maintain body tissues.

**Peptic ulcer.** This refers to an eroded lesion in the protective mucous membrane lining in the upper portion of the gastrointestinal tract. An ulcer can form in any area exposed to gastric acid and pepsin, a digestive enzyme instrumental in the breakdown of protein (hence the term *peptic ulcer*). Its exact cause is unknown; however, the bacterial organism *Helicobacter pylori* is thought to promote ulceration. Nonsteroidal anti-inflammatory drugs such as aspirin may also aggravate ulcer disease.

Diet is considered to be of little importance in treatment. However, antacids, which neutralize gastric acid, are still useful in treating ulcers and preventing recurrence. Drugs such as H<sub>2</sub>-receptor antagonists (for example, cimetidine or ranitidine) and proton pump inhibitors (for example, omeprazole or lansoprazole) have been introduced that lower the production of gastric acid. Antibiotics have also been used effectively to treat ulcers by eradicating *Helicobacter pylori*.

**Inflammatory bowel disease.** This term is used to describe a pair of chronic inflammatory disorders (Crohn's disease and ulcerative colitis) that affect the small and/or large intestine.

In dietary therapy, elemental or semi-elemental (peptide-based) formulas of amino acids, carbohydrates, fats, minerals and vitamins are occasionally used, since they are believed by some to be more easily absorbed and to support initial healing in response to antibacterial and anti-inflammatory medications. Gradually, the diet is advanced to a more complex regular diet. However, elemental diets generally have a high osmolality (high concentration), which can cause cramping and diarrhea. In some cases, surgery is required to resect the diseased portion of bowel. Parenteral nutrition may be needed temporarily after surgery.

### Liver disease

Two common diseases that affect the liver are hepatitis and cirrhosis.

**Hepatitis.** Hepatitis (inflammation of the liver) results in the destruction of patches of liver tissue. Most hepatitis is caused by viruses, but alcohol, drugs, and a variety of bacterial, fungal or parasitic infections can also cause liver inflammation. Hepatitis may be either acute (of limited duration) or chronic (continuing). Treatment of acute hepatitis includes supportive care with bed rest and nutritional therapy high in protein and carbohydrates. The hepatitis B, C and D viruses can cause chronic hepatitis, in which the infection is prolonged, sometimes lifelong. For hepatitis caused by alcohol consumption, total abstinence is the only cure. For chronic viral hepatitis, medications may produce a remission or even a cure in some patients.

**Cirrhosis.** Cirrhosis is a disease caused by chronic damage to the liver cells. In cirrhosis, bands of fibrosis (internal scarring) break up the normal structure of the liver. Nutritional therapy involves a high-protein, high-carbohydrate and low-fat diet; as with hepatitis, the tolerance of this diet will depend on the severity of liver dysfunction due to the cirrhosis. Sodium and fluid may also need to be restricted to help reduce fluid retention.

### Migraine headaches

There are multiple foods that may trigger a migraine attack. The most common food triggers are alcohol (especially red wine or beer), ripe cheeses, chocolate, citrus fruits, caffeine, nitrites (found in aged, cured or prepared meats) and monosodium glutamate (a food additive). Tyramine and other amines, found in many natural, baked or aged foods, can provoke the early blood vessel changes typical of migraine headaches. The foods most often found to act as headache triggers are those that cause blood vessels to dilate or constrict, or that act by possibly a different, unknown mechanism.

In addition to food triggers, other common migraine triggers include fasting or skipping meals, changes in the weather, and certain times in a woman's menstrual cycle.

Evidence suggests that certain nutritional deficiencies may be significant fac-

tors for many chronic headache sufferers. These include magnesium, vitamin B<sub>2</sub> and other deficiencies, such as lack of niacin, folic acid and iron. **PR**

*The next article in the series will focus on the role of nutrition in severely ill patients.*



## ARTICLE SUMMARY

- People with anorexia nervosa and bulimia nervosa extend their concern about weight to a neurotic extreme.
  - Cardiovascular disease is the leading cause of death in the United States.
    - Coronary heart disease is the major cause of heart attacks.
    - Nutritional therapy includes certain dietary components, as well as five or more servings of fruits and vegetables per day.
  - Hypertension, or high blood pressure, accelerates the process of atherosclerosis.
    - Lifestyle changes, including dietary treatment, are usually preferred over long-term use of drugs in treatment.
  - About 10% of people with diabetes have type 1 (or insulin-dependent) diabetes mellitus, and the other 90% have type 2 (or non-insulin-dependent) diabetes.
    - For many people with type 2 diabetes, dietary therapy involves weight reduction for the overweight individual and establishment of regular eating patterns for the lean patient with an appropriate weight.
  - The American Cancer Society has developed nutrition and physical activity guidelines to help people reduce the risk of developing certain kinds of cancer.
  - Osteoporosis, linked to dietary deficiencies in calcium, results from the loss of bone mineral and protein matrix from the bones.
    - Drug treatments should be taken in conjunction with calcium and vitamin D.
  - Gastrointestinal problems affect the body's ability to obtain nutrients from food to provide energy and maintain body tissues.
- Hepatitis (inflammation of the liver) results in the destruction of patches of liver tissue.
- Treatment of acute hepatitis includes supportive care with bed rest and nutritional therapy.
  - Cirrhosis is a disease caused by chronic damage to the liver cells.
    - Nutritional therapy involves a high-protein, high-carbohydrate and low-fat diet.
  - Multiple foods and factors may trigger a migraine attack.