



## TYPE 2 DIABETES

A DANGEROUS DISEASE  
YOU CAN AVOID

### Soaring Rates of Diabetes

Type 2 diabetes (hereafter diabetes) now afflicts nearly 24 million Americans aged 20 or older, including some 5 million people who have the disease, but do not know it. Moreover, doctors are seeing pre-school children with diabetes, mainly among those who are overweight. Diabetes is more common among Hispanics, African Americans and Asians and is more prevalent in the U.S. than in Europe and the rest of the world.

About 90 percent of people with diabetes have the type that does not require insulin treatment. These people can still produce insulin, the hormone that regulates the processing of protein, fat and carbohydrate. With some lifestyle changes, they may be able to turn the situation around and restore their metabolism to normal.

### Consequences of Diabetes

Having diabetes sets the stage for health problems involving the heart, blood vessels, nerves, eyes and kidneys. For example, a person with diabetes has triple the chance of developing and dying from heart disease. The risk of stroke is two to four times higher in diabetics, while high blood pressure, impaired vision (potentially leading to blindness) and poor circulation are much more likely. People with diabetes may develop kidney damage, ultimately requiring dialysis or a kidney transplant. Nerve damage can cause tingling and numbness in the toes or fingers and may lead to more serious problems. Many of these problems are avoidable by preventing diabetes or managing it effectively.

### Culprits Behind Diabetes

**Obesity:** By far the leading cause of diabetes is obesity. In fact, the rapid increase in diabetes parallels the surge in obesity. According to the U.S. government, more than 34 percent of Americans 20 years old or more are obese.

Both the total amount of body fat and its distribution contribute to the risk of diabetes. People whose body fat is concentrated in the abdomen, as reflected in one's waist circumference, are at greater risk of diabetes, insulin resistance and abnormal blood sugar control. A low-risk waist circumference is less than 92 cm (36 inches) for men and 88 cm (35 inches) for women. A good rule of thumb is to keep your waist circumference at less than half your height.

In obesity, the body cannot process or store all the fat it has, so it signals the pancreas to produce insulin. However, the places that usually process and store fat—liver, fat tissue and skeletal muscle—become resistant to insulin and cannot handle more fat. As a result, fat accumulates in the blood, liver, heart and pancreas. As insulin resistance increases, the pancreas tries to produce more hormone, but eventually its insulin-producing cells give out. Insulin resistance also causes the liver to produce more glucose (sugar). The resulting rise in blood sugar is the most common indicator of diabetes. Because obesity is such a critical contributor to diabetes, shedding extra weight is the key to preventing this disease.

**Other Contributors to Diabetes:** Besides obesity, other conditions that contribute to diabetes are physical inactivity, a family history of diabetes, unhealthy eating habits, increasing age, high blood pressure and elevated low-density ("bad") cholesterol levels. Becoming physically fit and improving one's diet are especially important in preventing diabetes. Both aerobic and resistance exercise lower diabetes and heart disease risks by reducing weight and waist circumference and improving glucose metabolism and heart-lung fitness. An extra perk is feeling better, too!

### Fish, Omega-3s and Healthful Eating

**Healthful Diets:** Healthful diets that discourage diabetes are high in fruits, vegetables and dietary fiber and have moderate amounts of fat, protein and carbohydrate. The latter should come mainly from whole grain foods and complex carbohydrates rather than sugars, refined cereals and processed baked goods. Both low-carbohydrate and low-fat diets can facilitate weight loss and good glucose control. However, each dietary approach has its drawbacks. Low-carbohydrate diets tend to be high in saturated fat and low in fruits, vegetables and whole grains, while low-fat diets are linked to high blood fat and low HDL levels.

**Low Glycemic Index Foods:** Food choices that include plenty of potatoes, pasta, white bread and soft drinks, are known as high glycemic index diets. They make insulin resistance and glucose control worse. A low glycemic diet triggers a more moderate blood glucose response after eating. Most international dietary guidelines endorse low glycemic index diets.

**Dietary Fiber:** The indigestible portion of plant foods—fiber—helps prevent weight gain and waist expansion, while lowering the chance of diabetes, especially in people at high risk of the disease. High fiber diets have beneficial effects on blood glucose, lipid levels and risk of heart disease. Recommendations for fiber consumption range from 25 to 50 grams/day, amounts not usually achieved without careful dietary planning.

**Type of Fat:** There is widespread agreement that eating foods rich in saturated fats (e.g., butter, cheese, whole milk products and fatty red and processed meats) and trans fat (hydrogenated and partially hydrogenated margarines and some baked products) work against insulin and blood cholesterol control. In contrast, replacing most saturated fats with monounsaturated and polyunsaturated fats, such as those in canola and olive oils, improves insulin sensitivity and glucose metabolism.

**Long-Chain Omega-3s:** These fatty acids are found mainly in fish and shellfish. They reduce the likelihood of heart disease mortality and several types of heart problems in healthy people and those with diabetes. Seafood omega-3s lower blood fat levels, may increase HDL, reduce platelet aggregation (blood-clotting) and in most studies do not harm glucose control. In addition, seafood omega-3s may improve arterial blood vessel function, reduce the progression of artery narrowing and lower the risk of coronary artery disease. Thus, seafood omega-3s reduce several heart disease risks in people with diabetes and those at high risk of it.

Diets rich in seafood omega-3s may reduce fat tissue—encouraging news for those with too much body fat. In a recent study, women with diabetes who consumed a moderate amount of omega-3s had lower fat mass and smaller fat cells even though they did not lose weight. Further, there was no deterioration in their glucose control or insulin sensitivity. Another study found that eating fish daily and losing weight improved insulin and glucose metabolism in overweight individuals.

For those with poor glucose control or insulin resistance, the effects of seafood omega-3s are less clear. However, the evidence suggests that higher consumption of omega-3s or fish may have a positive effect on glucose and insulin metabolism.

### Get A (Healthy) Life to Prevent Diabetes

There is convincing evidence that people at high risk of diabetes who lose weight and increase their physical activity are much less likely to develop diabetes. These actions reduced the chance of diabetes by more than 50 percent and were far more effective than medications. In Finland, China, Sweden and the U.S., people likely to develop diabetes who lost weight, exercised more often and improved their eating habits lowered their chances of progressing from insulin resistance to diabetes by as much as 58 percent! A recent Boston study of older adults at risk of diabetes found that those who had the healthiest lifestyles were 80 percent less likely to develop diabetes as compared with those having the least healthful habits. The lifestyles that made the difference were regular physical activity, a healthful diet, not smoking and moderate or no alcohol consumption. If the healthy lifestyle participants were not overweight, the chance of developing diabetes was even lower at 89 percent.

Diabetes, now considered epidemic, can be prevented by healthy lifestyle and food habits. Seafood omega-3s make food choices more healthful and lower the dangers of obesity, diabetes and heart disease.

### HEALTHFUL EATING TO PREVENT DIABETES

- Eat plenty of fruits, vegetables and whole grain foods
- Choose foods high in fiber
- Replace saturated and trans fats with mono- and polyunsaturated fatty acids, such as those in canola and olive oils
- Increase consumption of fish and seafood omega-3s
- Low glycemic index diets favor healthy blood sugar responses

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