



## Exercise and Diabetes

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**D**iabetes is a disease in which blood glucose (sugar) is not well controlled. In healthy individuals, the hormone insulin works to ensure that blood glucose levels stay within a normal range. In type 1 diabetes, the body stops producing insulin, and this often occurs early in life. Without insulin, the body's cells cannot easily take in glucose. As a result, the cells are starved of glucose (an important source of energy), and blood glucose levels climb to dangerously high levels. Type 2 diabetes is a disease in which insulin is available, but the body's cells are unresponsive to it. Risk factors such as obesity, a family history of type 2 diabetes, and a sedentary lifestyle are linked to the development of type 2 diabetes. More than 90% of people with diabetes have type 2 diabetes. Gestational diabetes is a form of the disease that develops during pregnancy. Although the causes of the various types of diabetes differ, the negative health effects are similar, including an elevated risk of heart disease, nerve and blood vessel damage, and kidney disease.

### BENEFITS OF EXERCISE

Exercise can be an important therapy for people with diabetes. Exercise assists with weight management, enhances the cells' ability to take in glucose, and lowers the risk of heart disease. For people at risk for developing type 2 diabetes, exercise is an important preventive tool. However, it is important for anyone with diabetes to consult with his or her physician before beginning an exercise program. It also is prudent to consult with a certified clinical exercise specialist or a registered clinical exercise physiologist. These individuals have the experience and training

necessary for shaping individualized exercise plans for people with disease.

### GENERAL RECOMMENDATIONS

For people with type 1 and type 2 diabetes who can exercise safely, the general aerobic exercise recommendations are consistent with those for healthy individuals: 3 to 7 days per week at 50% to 80% of heart rate reserve for 20 to 60 minutes per day in bouts of at least 10 minutes. Resistance exercise also may yield health benefits because it assists the muscles with using glucose. Resistance training should include 8 to 10 exercises, incorporating the major muscle groups and occur 2 to 3 days per week (at least 48 hours between sessions). Sessions should consist of 2 to 3 sets of 8 to 12 repetitions for each exercise.

### SPECIAL CONSIDERATIONS

Special precautions are important for diabetics when making decisions about exercise. It is critically important that blood glucose be monitored before and after exercise, and exercise should be delayed if glucose levels are extremely elevated (hyperglycemia) or depressed (hypoglycemia) before exercise. It also is necessary to carefully control food intake, medications, and exercise to avoid hypoglycemia and hyperglycemia. Diabetics are at an increased risk of dehydration, so adequate fluid intake must be achieved. Damage to the nerves and blood vessels in the feet can lead to sores that heal slowly, thus, special attention to foot care must be provided. Individuals with diabetes-related damage to the eyes need to be extra cautious to avoid spikes in blood pressure that can lead to further damage.

Exercise can be safely incorporated into the lives of most diabetic individuals. However, the potential dangers linked with exercise and the need for specific exercise modifications make it imperative that patients get clearance from their physician and special instruction from a trained fitness professional to address these special needs.

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