

# Exercise Principles for People with Diabetes

## Benefits of Exercise

- Improves insulin sensitivity, which means your insulin works better when you exercise. If you take insulin or diabetes pills that lower your blood glucose, then you may need to reduce your medication dose to help prevent hypoglycemia. Ask your health care provider for advice.
- Lowers blood glucose levels in people with type 2 diabetes.
- Helps with weight control.
- Strengthens, builds and tone muscles.
- Reduces risk for heart disease.
  - Lowers LDL - the bad cholesterol
  - Raises HDL- the good cholesterol
  - Strengthens the heart muscle
- Lowers blood pressure.
- Improves circulation.
- Preserves bone mass and helps prevent osteoporosis.
- Enhances quality of life, reduces stress, and boosts self-esteem.
- May help to prevent diabetes in high-risk individuals.
- It is fun. You can do it with friends and family or you can do it alone.

The American Diabetes Association suggests 150 minutes of exercise each week with not more than two days in a row without exercise.

The Surgeon General recommends: moderate exercise of least 30 minutes per day.

## Type of Exercise:

Aerobic exercise consists of using the major muscle groups for at least 10 minutes at a time.

- Examples include walking, swimming, cycling, stair-master, rowing and skiing machines, jogging, aerobics classes, and dancing.
- The goal is at least 150 minutes per week of moderate intensity exercise. Or get at least 90 minutes per week of vigorous exercise.
- Start with what you are able to do, then work your way up to sessions that last 30 minutes or more.
- The goal frequency is at least every other day.

Maximal Heart Rate (MHR)

$$\text{MHR} = 220 - \text{age}$$

Moderate intensity exercise is 50-70% MHR

Vigorous intensity exercise is over 70% MHR

Resistance exercise is strength training. Not only does resistance training help to tone muscles and improve muscle strength, it helps to strengthen bones. Improving muscle mass has a positive impact on metabolism, heart health, and diabetes.

- Use hand weights, resistance machines, and elastic bands.
- Sit-ups, pull-ups and push-ups use your own body weight for resistance.
- Try to do three sets of 8-10 repetitions. Target all major muscle groups.
- Gradually work up to sessions that are 15-30 minutes in length.
- Do resistance exercises 2-3 times per week.

## Warming up and Cooling Down

Exercise sessions should start with a warming up period to get the muscles, joints, and ligaments ready for your workout. Warming up can just be a lower intensity of your planned workout. For example, start walking slowly for 5 minutes to warm up before your walk or run. Cool down at the end of your exercise session by slowing the pace of your activity until your heart rate and breathing are back to normal.

## Stretching

It is important to stretch. Focus on each major muscle group and hold the stretch for 10-30 seconds. You can stretch before and after your workouts.

### **Monitor the effects of exercise on your blood glucose**

- Find out how exercise affects you by checking your blood glucose levels before and after exercise. For long duration exercise sessions, check blood glucose levels during your workout.
- Exercise improves insulin sensitivity, which means that insulin works better while you exercise, and for some time after. People with type 2 diabetes have insulin resistance. Since exercise directly improves insulin action, it is a key treatment strategy for type 2 diabetes.
- Blood glucose levels can continue to drop even after the exercise has stopped. Blood glucose may drop for hours after prolonged or strenuous activity. Delayed hypoglycemia due to exercise alerts you to the need for future adjustments in your meal plan or medication doses. Keep written records for problem solving.

### **High and Low Blood Glucose**

- If you take pills or insulin to treat your diabetes, you may need to have your doses cut back to reduce your risk for low blood glucose.
- To reduce the risk of hypoglycemia, do not exercise when your insulin is at its peak activity.
- Do not begin exercising if your blood sugar is below 100 mg/dl. Have a carbohydrate-containing snack first.
- If your blood glucose is below 70 mg/dl, eat 15-30 grams of carbohydrate to treat the hypoglycemia. Glucose tablets, fruit juice, fruit, or hard candies are good choices. Re-check your blood glucose in 15-20 minutes. Once your blood glucose level is above 100 mg/dl, have a snack containing starch plus protein before beginning to exercise.
- If you have type 1 diabetes, and your blood glucose level is above 250 mg/dl, check urine for ketones. Lack of insulin can cause production of ketones. If you missed an insulin dose, exercise may increase the rate of ketone production. Assess your need for additional insulin. Wait until the blood glucose levels improve before beginning to exercise.

### **Food and Fluids**

- Exercise increases your fluid requirements. Drink plenty of water.
- Fruit juice and sports drinks can lead to high blood glucose levels and should only be used to prevent or treat hypoglycemia.
- Alcohol increases the risk of severe low blood glucose in those who take insulin or certain diabetes pills.
- If you do not take medicines to treat your diabetes, you are not at risk for low blood glucose.
- If you do take medicines that can lower your blood glucose, you may need snacks throughout your activity, especially for long duration, or high intensity workouts.
- Carry a source of fast-acting carbohydrate. Glucose tablets, fruit juice, fruit, or hard candies are appropriate choices to treat hypoglycemia.

## Cautions

- Your health care provider may suggest an exercise stress test if you have are at an increased risk for heart disease. This test shows how your heart responds to exercise.
- If you have any diabetes complications, ask your healthcare provider if you have exercise limitations. Some forms of exercise can worsen complications.
- Practice good foot care. This is important if you have nerve damage in your feet. Wear absorbent socks and well-fitting shoes. Be sure to inspect your feet daily and promptly report any problems to your health care provider.
- Wear a medical alert tag to assure that you will get the care that you need should any problem arise.
- If you have type 1 diabetes, carry glucagon and train your partner on how to use it.