Why Do I Have Low Blood Sugars After Exercise?

DIABETES DEPARTMENT

Low blood sugar is defined as a blood sugar level below 70 mg/dl. When you exercise, your muscles need more sugar to supply energy. Moderate to intense exercise may cause your blood sugar to drop during exercise and for the next 24 hours following exercise.

When you exercise the body uses two sources of fuel, sugar and free fatty acids (that is, fat) to generate energy. The sugar comes from the blood, the liver and the muscles. The sugar is stored in the liver and muscle in a form called **glycogen**. During the first 15 minutes of exercise most of the sugar for fuel comes from either the blood stream or the muscle glycogen which is converted back to sugar. After 15 minutes of exercise, however, the fuel starts to come more from the glycogen stored in the liver. After 30 minutes of exercise, the body begins to get more of its energy from the free fatty acids. As a result, exercise can deplete sugar levels and glycogen stores.

The body will replace these glycogen stores but this process may take 4 to 6 hours, even 12 to 24 hours with more intense activity. **During this rebuilding of glycogen stores a person with diabetes can be at higher risk for hypoglycemia.**

GUIDELINES FOR PREVENTING EXERCISE RELATED HYPOGLYCEMIA

- Check your blood sugar before exercising to make sure your blood sugar is sufficient and/or consume an appropriate snack.
- Avoid exercise at the peak of your insulin action.
- Avoid late evening exercise. Exercise should be completed 2 hours before bedtime.
- Avoid alcohol consumption prior to or immediately after exercise.
- Avoid hot tubs, saunas and steam rooms directly after exercise. These continue to maintain an increased heart rate and may continue to lower your blood sugars.
- Limit your exercise sessions to 1 or 2 per day. Additional sessions increase the likelihood of hypoglycemia.
- In the past, it was believed that injecting insulin into exercising muscle increased absorption of the insulin resulting in hypoglycemia; now it is believed that the timing and action of the insulin are more likely to be the key factors.
- Check your blood sugar immediately after exercise to prevent low blood sugars from occurring hours after exercise. It may also be necessary to check your blood sugar more often for 2 to 4 hours after exercise. Moderate intense exercise may cause your blood sugar to drop for the next 24 hours following exercise.

IF BLOOD SUGAR IS LESS THAN 100 MG/DL IMMEDIATELY AFTER EXERCISE

- Follow post-exercise snack guidelines. If you are not scheduled for a snack or a meal for 30-60 minutes after exercise, 15 grams of carbohydrate should be sufficient to prevent low blood sugar. If no meal or snack is scheduled for more than one hour, take 15 grams of carbohydrate and 7-8 grams of protein.
- Increase carbohydrates before exercise.
- Decrease the dose of active insulin for the next exercise session.
- Consider decreasing the insulin dosage following exercise.
- If your blood sugar at bedtime is still less than 100 mg/dl, **double** your bedtime snack, or if possible, decrease your insulin dose acting during bedtime.

GUIDELINES FOR UNPLANNED EXERCISE

Sometimes exercise or physical exertion occurs spontaneously or is unplanned. You may need extra food at these times in order to maintain the balance between your insulin or oral medication and the energy needed to exercise. A number of factors will determine if you need food and how much food is necessary.

- Snacks are necessary for exercise beginning 2 hours of more after your last meal.
- Snacks should be taken for exercise lasting 1 hour or more.
- Long duration or all-day activities may require both a snack adjustment and an insulin adjustment.
- If you are attempting to lose weight, adjust your insulin or medication rather than eating extra food.

Be sure to talk to your diabetes educator for more information about how exercise will work best with your diabetes.

WHY DO BLOOD SUGARS GO UP, SOMETIMES, AFTER I EXERCISE?

When you exercise your muscles need more sugar to supply energy. In response, your liver increases the amount of sugar it releases into your bloodstream. Remember, however, that sugar needs insulin in order to be used by your muscles. So if you do not have enough insulin available, your blood sugar levels can actually increase right after exercise. Basically, stimulated by the demand from your exercising muscles, your body is pouring sugar into your bloodstream. If you do not have enough insulin available to "unlock the door" to your muscles, the sugar cannot get into your muscles to provide needed energy. The end result is that sugar backs up in your bloodstream causing higher blood sugar readings.

GUIDELINES FOR EXERCISING SAFELY:

- Consult your Health Care Provider before starting an exercise program.
- If you are over the age of 35 you may need a stress test.
- Check your blood sugar before and after exercise.
- Do not exercise if your blood sugar is over 250 mg/dl and you have ketones.
- If your blood sugar is over 250 but **no ketones** are present, follow these guidelines:
    - **Type 1:** If blood sugars are 300 or more, test within 5-10 minutes of beginning exercise. If your blood sugar is dropping, you may continue. If it is not dropping, stop exercising.
    - **Type 2:** Do not exercise if blood sugars are 400 or more
- Plan exercise to prevent low blood sugar reactions.
    - Exercise 1 to 1 ½ hours after eating.
    - Always carry a carbohydrate snack (juice, glucose tablets, etc.) with you.
    - **Drink plenty of fluids.**
    - Wear shoes and equipment that fit well.

WHAT SHOULD MY BLOOD SUGAR GOALS BE AROUND EXERCISE:

Blood sugar goals around exercise should be high enough to avoid hypoglycemia both during and after exercise, and return to target blood sugar levels following exercise. General guidelines suggest eating a snack with carbohydrate if blood sugar is less than 100 mg/dl prior to exercise.

Talk to your health care provider about your personal blood sugar goals around exercise and type of exercise that is right for you.

Planning for an exercise program should take into account four things:

- Type of activity
- Intensity
- Duration
- Frequency

To get the maximum benefit from the **type of activity** it generally requires that you expend 5 to 7 times more energy than when resting.

The **intensity** of exercise is determined by monitoring heart rate and other signs of stress. The easiest way to monitor heart rate is by placing the fingers on the artery of your inner wrist and measuring the pulse rate for 10 seconds and then multiplying by 6 which gives the heart rate per minute. This should be done within 5 seconds of stopping activity. The new exerciser should monitor his or her pulse rate 4 or 5 times during an exercise session. If you are on a medication or have neuropathy that affects heart rate, then you must be more cautious. Since your pulse rate may underestimate the actual stress on your body.

The **duration** and **frequency** of exercise depends upon age, the time you can spare, and your level of fitness. In general, three to five exercise sessions per week of 15 to 30 minutes each, reaching 60% to 90% of **maximal heart rate**, would be the minimum to achieve health and fitness benefits. Most people should start slowly and increase intensity and duration gradually. Walking three times per week can be beneficial for almost everyone.

Source: www.joslin.org/info (6/15/12)