

## Patient Handout

# When Glucose Levels Are Too Low: A Major Barrier to Taking Control of Your Diabetes

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When taking control of your diabetes, the goal is to keep your blood glucose levels as close to normal as possible. By doing this, many diabetes-related complications, including eye, nerve, and kidney problems, can be avoided. Unfortunately, when blood glucose levels are kept close to normal, there is the chance that they can become too low. This condition is called *hypoglycemia*, and it is a major barrier to taking control of your diabetes.

### Blood Glucose Levels: What Is Normal and What Is Low?

Normal blood glucose levels are 80 to 130 mg/dL before meals and 140 to 180 mg/dL 1 to 2 hours after meals. These are the levels you are working to maintain.

A blood glucose level of 70 mg/dL or less is considered too low. Mild hypoglycemia is 70 mg/dL, moderate hypoglycemia is 60 to 69 mg/dL, and severe hypoglycemia is 50 to 59 mg/dL.

### Why Is It Important to Prevent Hypoglycemia?

Just like a car, the human body needs fuel to provide energy. Glucose (or sugar) is one of the main fuels the body uses. Glucose is especially important for normal functioning of the brain. If you have enough glucose in your body, your brain can work normally. If you don't have enough glucose, or if your body uses the glucose too quickly, your glucose levels can become too low, and the brain cannot work normally. That is why it is important to prevent hypoglycemia.

### Why Does Hypoglycemia Occur?

There are many reasons why hypoglycemia can occur in someone who has diabetes. Here are some of those reasons:

- Exercising more or harder than usual.
- Eating less than usual for a meal or snack.
- Delaying or skipping a meal or snack.
- Eating new types of food.
- Taking too much insulin or oral diabetes medications.
- Taking other medications that may lower your blood glucose level.
- Drinking too much alcohol on an empty stomach.

### Warning Signs and Symptoms

Most people develop warning signs or symptoms when their blood glucose level drops below 70 mg/dL. These signs and symptoms include the following:

- Nervousness.
- Sweating.
- Hunger.
- Weakness.
- Shakiness.
- Dizziness or light-headedness.
- Headache.
- Tingling sensations around the mouth.
- Pale skin.
- Heart palpitations.

You may experience different signs and symptoms every time you have an episode. Or you may experience the same symptoms every time you have an episode, but then the symptoms may change or become less pronounced. Your symptoms may be different from someone else's symptoms. It is very important, therefore, to pay attention to your blood glucose levels and to how you are feeling. It is also important to tell friends and family members about the signs and symptoms of hypoglycemia in case the symptoms become severe.

### Symptoms of Severe Hypoglycemia

When a person's blood glucose level is less than 45 mg/dL, the brain does not get enough glucose, and severe hypoglycemia develops. Symptoms of severe hypoglycemia include:

- Sleepiness.
- Confusion.
- Difficulty speaking.
- Seizures.
- Loss of consciousness.
- Coma.
- Death.

Most people develop warning symptoms before severe hypoglycemia occurs, but some people do not. Some people may lose consciousness without knowing that their blood glucose level is low. This is most likely to occur in people who have had diabetes for many years. Although monitoring blood glucose levels is important in all persons with diabetes, it is especially important in persons who do not develop the usual warning signs and symptoms of hypoglycemia.

Be sure to tell your health care provider if your blood glucose level drops below 50 mg/dL and you do not have symptoms of hypoglycemia. This is called *hypoglycemia unawareness*. You will need to test your blood glucose levels more frequently, especially if you drive an automobile. Ask your health care provider about a continuous glucose-monitoring device; this device can help you avoid severe hypoglycemia.

### What to Do if You Have a Hypoglycemic Episode

Hypoglycemia can quickly progress from mild to severe symptoms, including loss of consciousness. Therefore, it is important to act quickly.

- If you begin to have warning symptoms of hypoglycemia, check your blood glucose level immediately.
- If your glucose level is less than 70 mg/dL, you need to supply your body with sugar right away.
- You should also supply your body with sugar if you have warning symptoms but cannot check your blood glucose level. It is always better to treat even if you cannot test right away.

### How to Treat Hypoglycemia

To supply your body with sugar, you need to have about 10 to 15 grams of glucose in a form that your body can easily and rapidly absorb.

Prompt treatment of hypoglycemia is very important, but it is also important not to overtreat. If you take in too much glucose, you will become *hyperglycemic* later.

#### ***If you are awake and able to chew and swallow food***

If you are awake and able to eat food, you can supply your body with glucose by eating or drinking foods that are absorbed rapidly in the body. The following are examples of foods that provide 10 to 15 grams of glucose:

- 5 or 6 pieces of hard candy.
- 1/2 cup of regular soda (not diet soda).
- 1/2 cup of fruit juice.
- 1 to 2 teaspoons of sugar.

You should also keep glucose tablets with you at all times. If none of the foods listed here is available, you can take 2 or 3 glucose tablets to rapidly raise your blood glucose level. You can buy these tablets at your local drugstore.

After taking one of the foods listed here or the glucose tablets, wait about 15 minutes and then recheck your blood glucose level. If your glucose level is still less than 70 mg/dL, repeat the treatment.

Once your glucose level is normal, consider eating a regular meal or snack within the next hour. The amount of food you eat will depend on the amount and types of insulin you are taking and the amount of exercise or physical activity you plan on doing.

Ideally, you should not treat hypoglycemia with sugary foods that contain a lot of fat, such as chocolate bars or baked goods. The fat in these foods slows the movement of glucose into the bloodstream. However, if appropriate foods or glucose tablets are not available, then sugary foods containing fat can be used.

#### ***If you are unable to chew or swallow***

If you begin to experience a hypoglycemic episode so severe that you are unable to eat or drink anything by mouth, someone else can give you an injection of glucagon. You should *never* be given food or drink if you are unconscious. Once you are awake and able to take something by mouth, you should then consider eating or drinking something.

Glucagon is a substance that causes glucose to be released from the liver and into the bloodstream. Blood glucose levels will quickly rise after an injection of glucagon. If your health care provider thinks it is appropriate, he or she will provide you with a prescription for glucagon, and the pharmacist will describe how to use it. If you are given a prescription for glucagon, your friends, family members, and coworkers will need to be taught how to use it in an emergency.

If glucagon is not available, someone should call 911 immediately if you are unresponsive or unable to chew or swallow simple carbohydrates.

### Preventing Hypoglycemia

To prevent hypoglycemia, your diabetes medications must be balanced with your food intake and activity level. For example, if you take insulin but then skip a meal, this balance will be off and hypoglycemia may occur. The following are steps you can take to help prevent hypoglycemic episodes:

- Take your diabetes medications at regularly scheduled times.
- Test your blood glucose level regularly and frequently.
- Check your blood glucose level before, during, and after heavy exercise or strenuous activity.

- If you become ill, check your blood glucose level more often than usual.
- Do not skip meals or snacks.
- Eat consistent amounts of food at meals and snacks.
- If you drink a beverage containing alcohol, test your blood glucose level regularly and have a snack or meal if your blood glucose level becomes too low.
- If you plan on changing your regular activity level (for example, you plan to begin an exercise program), talk to your health care provider about the need to adjust your medications.
- If you plan on being more active than usual on a particular day (for example, you plan to do some heavy gardening), consider having an additional snack that day before the scheduled activity.
- Always have a glucose source on hand.
- Always carry or wear some form of medical identification noting that you have diabetes.
- If you experience hypoglycemia frequently, tell your health care provider. He or she may need to make a change in your medication, diet, or exercise regimen.
- If you take medicine or insulin that can cause hypoglycemia, you should check your blood glucose level before you drive a car or operate heavy machinery.

### **Nighttime Hypoglycemia**

Hypoglycemia that occurs at night can be harder to detect. The following signs suggest nighttime hypoglycemia:

- Damp pajamas or sheets in the morning, indicating nighttime sweating.
- Nightmares.
- Restless sleep.
- Bedwetting (in children).
- Waking with a headache.
- Waking still feeling tired.
- Waking feeling confused.

If you suspect you are experiencing nighttime hypoglycemia, set your alarm to wake you in the middle of the night and check your blood glucose level. If it is too low, then treat appropriately. Tell your health care provider if you have nighttime hypoglycemia frequently. This may indicate that you need a change in your medication or diet regimen.

### **Talk With Your Health Care Provider**

Keep track of your hypoglycemic episodes, and share this information with your health care provider. Continuous glucose monitoring can help tremendously. Frequent episodes of hypoglycemia may indicate the need for a change in your medication or diet regimen.

### **Tell Others About Hypoglycemia**

It is important for you to tell others what you know about hypoglycemia, especially your friends, family members, coworkers, and teachers. Then, if you develop hypoglycemia, others will be able to identify the symptoms and help you with treatment.

### **Putting It in Perspective**

Trying to achieve and maintain blood glucose levels as close to normal as possible will help to prevent the complications of diabetes. There is the chance, however, that blood glucose levels will become too low and a hypoglycemic episode will occur. But trying to avoid a hypoglycemic episode is not a reason to allow your blood glucose level to become too high. Instead, you should try to prevent hypoglycemia whenever possible and be prepared to monitor and treat episodes if they do occur. Be sure to talk with your health care provider about the strategies recommended here. Tell your friends, family members, and others about hypoglycemia so they can help you avoid an episode or help treat an episode if one should occur.