

# LOW/HIGH BLOOD SUGAR EMERGENCIES



## WHAT ARE BLOOD SUGAR EMERGENCIES?

Our bodies require insulin to convert blood sugar, or glucose, into energy. All forms of diabetes carry the threat of emergencies related to low or high blood sugar levels. This brochure describes these emergencies and provides general guidelines for their treatment.

Type 1 diabetes is a chronic autoimmune disease in which the body's own immune system has "attacked and killed" insulin producing beta cells, thereby necessitating multiple daily injections of insulin or continuous infusion of insulin through a pump (to lower blood sugar levels) as life support. Type 2 diabetes is a serious condition in which the body's ability to respond to insulin has become compromised, thereby requiring diet, exercise, and sometimes oral medications to aid the body in better using the insulin produced.

For people with all forms of diabetes, managing blood sugar levels is a matter of balancing three variables: food, physical activity, and insulin. Insulin and physical activity lower the blood sugar level; food raises the blood sugar level. When blood sugar levels are not maintained properly, people with diabetes are threatened with either of two emergencies:

*Hypoglycemia (low blood sugar)*, occurring when blood glucose levels drop too low. Hypoglycemia is also called insulin reaction or insulin shock.

*Hyperglycemia (high blood sugar)*, caused by the buildup of glucose in the bloodstream.

Both situations can be life threatening if left untreated, but a hypoglycemic emergency can develop quickly, and is, therefore, potentially more dangerous.

## WHY HYPOGLYCEMIA OCCURS

Controlling blood sugar is no easy task for people with diabetes. Many factors can upset the balance, including illness, stress, medications other than insulin, and drinking alcoholic beverages. If the balance is upset – for example, by too much exercise or too little food – the result is hypoglycemia. Hypoglycemia occurs more commonly with insulin therapy, but it can also happen with some oral medications.

### Hypoglycemia Can Happen Quickly

Hypoglycemia can occur on at any time and with surprising suddenness. You, your friends and family, and those who work with you should know how to recognize and treat a low blood sugar condition. Because low blood sugar causes confusion, you should check your blood sugar before driving a car or operating machinery. Be prepared to stop what you're doing immediately and treat your low blood sugar if you experience one or more of the following symptoms.

### Warning Signs of Low Blood Sugar Emergency

- Headache
- Sweating
- Pale, moist skin
- Cold and clammy
- Extreme/sudden hunger
- Weakness/dizziness
- Shakiness
- Fatigue/drowsiness
- Rapid pulse rate
- Blurred/double vision
- Shallow breathing
- Confusion/inattention
- Loss of coordination

### Symptoms That Require Serious Medical Intervention

(call 911, administer glucagon if you know how to do so – see information below)

- Seizure
- Loss of consciousness

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## TREATMENT FOR LOW BLOOD SUGAR – YOUR BODY NEEDS SUGAR, AND FAST

### Mild Insulin Reaction

Check your blood sugar, if you are able. If your blood sugar is below 4 mmol/L, quickly eat a source of sugar. Common remedies include the following:

- 2-4 glucose tablets or glucose gel (available in drugstores).
- 6 oz. of soda (non-diet).
- 4-6 oz. of fruit juice.

Any fast-acting sugar will do. You will soon learn from experience what works best for you. You should always carry some form of sugar with you so that you can take care of yourself even if no food is readily available.

If possible, avoid using foods like cake, cookies, pie, ice cream, and chocolate, which have high fat content and therefore relieve hypoglycemia relatively slowly. Because the response time from such foods is slow, people tend to overeat them. Such overeating produces prolonged high blood sugar levels later.

Once you've taken some sugar, you should rest for 10 to 15 minutes to let your body absorb it. Fifteen minutes after the treatment, retest. If your results are the same, repeat the treatment. If your blood sugar is lower, repeat with a higher amount of sugar (double) or call for assistance.

**Important:** If you have not improved in 30 minutes, call for assistance.

### Severe Insulin Reaction

If unable to take food or drink, but still conscious, instant glucose gel, cake icing from a tube, jam, or syrup can be rubbed on the inside of the cheek or on the gums with a finger so it can be absorbed without risk of choking. Glucagon, which is a prescription drug taken by injection, may be given for emergency use to raise the level of sugar in the blood.

When the symptoms have subsided, eat something that takes longer to digest in order to prevent another reaction. Drink some milk or eat a peanut butter, meat, or cheese sandwich.

### If Unconscious

If the person is unconscious or having a seizure, you should inject glucagon and call their doctor. Do not give anything by mouth. If you do not know how to give glucagon, do not have it available, or there is no response to glucagon, call 911 for an ambulance or emergency medical unit and get the person to the hospital immediately.

Instructions for using glucagon are provided with the product. It is a safe drug, with no danger of overdose. Because it may occasionally cause nausea and vomiting, a person receiving an injection should be lying on his or her side to prevent choking. If the blood sugar level does not rise within 15 minutes, another dose may be administered. When he or she awakens, some form of complex carbohydrate should be eaten right away. The doctor should be notified if a person experiences this type of extreme hypoglycemic reaction.

## HYPERGLYCEMIA

The two emergency conditions related to high blood sugar are *ketoacidosis* and *hyperosmolar nonketotic coma*. Both conditions can develop gradually, and are serious, life-threatening emergencies requiring medical treatment.

Ketoacidosis is more commonly associated with Type 1 diabetes. Ketoacidosis can occur when the body breaks down fats for energy because of a lack of insulin. As a result, harmful acids called ketones are formed. Ketones are excreted in the urine and special kits are available to test the urine for ketones. Call your doctor whenever your urine tests positive for ketones.

Hyperosmolar nonketotic coma occurs more commonly in older people with Type 2 diabetes. Hyperosmolar nonketotic coma can occur when blood sugar levels are high over a prolonged period of time.

The symptoms of hyperglycemia are the same as for untreated diabetes. A number of factors can cause high blood sugar, including eating too much, taking too little insulin, skipping your diabetes medication, taking other medications, or inactivity. Infection, sickness, or stress also can cause blood sugar to rise.

When you are sick, it's important to continue taking insulin even if you have trouble eating. Ask your doctor how to handle sick days.

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## PREVENTION OF BLOOD SUGAR EMERGENCIES

### Be Aware

Typical causes of hypoglycemia are eating too little food, eating off schedule, skipping a meal, excessive or unanticipated exercise, and too much insulin. Being aware of such factors and avoiding them can avert an emergency situation.

### Monitor Blood Glucose Levels

Test your blood sugar often, especially if you have frequent insulin reactions or if your blood sugar levels are unexpectedly high. If you have high blood sugar first thing in the morning, you may need to inject insulin in the late evening in order to keep blood sugar levels normal overnight.

Tell your health care professional if you experience frequent insulin reactions or high blood sugars.

### Prepare for Exercise

Insulin works more efficiently when you exercise, which may result in blood sugar that is too low. To prepare for exercise, eat a slowly absorbed snack such as a cheese or meat sandwich. For every 30 minutes of anticipated exercise, eat 15 grams of carbohydrates to cover the increased activity.

Insulin is released more quickly if it is injected into the arm or leg being exercised. If you are going to exercise using primarily your legs (i.e., jogging), don't inject into your thigh. Choose the arm or abdomen instead.

### Be Ready for Emergencies

Diabetes-related emergencies can arise at any time. To minimize health risks, take the following precautions:

- Always carry a source of fast-acting sugar.
- Always carry or wear a form of medical identification, such as a MedicAlert® bracelet, indicating that you have diabetes, what medication you are taking, and the name of your health care provider.
- Always test blood sugar before driving your car or operating heavy machinery and don't do these activities until your blood sugar level is within normal range.
- Tell all teachers, family members, co-workers, etc. about insulin reactions and their treatment.

Awareness of and prompt attention to the warning signs of low and high blood sugar can prevent a more serious problem.

*The information in this brochure is not intended to take the place of medical advice. For guidance on topics discussed, consult your health care professional.*

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