

HYPOGLYCEMIA

Hypoglycemia (insulin reaction, insulin shock, low sugar reaction) can occur when the blood sugar either drops too low (usually below 60 mg/dl) or drops too quickly (even if the absolute blood sugar is above 60). Sugar is the body's primary fuel source, and blood sugar levels are normally tightly regulated. If the blood sugar drops too low, the body has several mechanisms to raise the blood sugar level. The adrenal glands release adrenalin, which stimulates the release of sugar stores from the liver and kidney, and promotes conversion of other compounds to sugars. Cortisol is another adrenal hormone that when released antagonizes the effect of insulin which helps to raise blood sugar levels. Glucagon is a third hormone that is released from the pancreas and will also mobilize stores of blood sugar and reduce sugar utilization in the liver so it is more available elsewhere. Together, these counterregulatory hormones help to protect against blood sugar levels falling too low and causing symptoms. If these hormones are not functioning properly, or their effects are overcome by a rapid or severe fall in blood sugar levels, symptoms do occur. The onset of symptoms is typically sudden. They may include:

- abnormal behavior
- blurred vision
- convulsions
- dizziness
- drowsiness
- fatigue
- headaches
- hunger
- nausea
- nervousness
- pallor
- shakiness
- shallow respirations
- sweating
- weakness

Each individual may respond differently with a hypoglycemic reaction, but in any one individual the symptoms are usually the same for each episode. Some or all of the above symptoms are usually present. If the symptoms are not severe, try to check a blood sugar first. If the symptoms are severe, don't wait--act immediately. If the symptoms do not improve in 15 minutes, retreat them. If a person is unresponsive, call the doctor or hospital emergency room.

Treat a hypoglycemic reaction by giving a simple sugar that is rapidly absorbed. Either swallow the sugar tablet or food item or put it between the cheek and gum so it can be absorbed through the buccal mucosa. Give 2 glucose tablets OR 4-6 ounces of orange juice OR 4-6 ounces of apple juice OR 2 sugar cubes OR 2 pieces of candy. If the person is not unconscious, wait 15 minutes. If the person is feeling a little better, then give a more substantial snack containing some protein (sandwich, milk, peanut butter and crackers, cheese and fruit) to carry them through to the next meal and prevent a

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repeat reaction within the next hour. This last point is important. Many people treat a hypoglycemic episode with a simple sugar, feel better, and think they're done. That's NOT the case. If you do not THEN have a more substantial snack or eat a meal (if its mealtime), in another 30 minutes or so the hypoglycemic reaction could recur with worse symptoms.

If the person is unconscious, you should not give anything to swallow. IF YOU HAVE A GLUCAGON KIT at home, you can use it to inject glucagon. Most of the time after a glucagon injection, the person will awaken in a couple minutes. A sugar tablet or sugar cube or jelly can be placed between the cheek and the gum for oral absorption through the buccal mucosa. This last method, however, can potentially cause choking if it gets in the back of the mouth. Buccal mucosa absorption doesn't work as well as swallowing something. Otherwise, you MUST call 911. Minutes may be important!! Once the person is awake again, give a more substantial snack by mouth as described above. For serious low blood sugar reactions (those that cause a person to lose consciousness) you should call the doctor to inform him of what happened.

Glucagon kits are available by prescription through your pharmacy. They contain a prefilled syringe of this hormone. Anyone can open up the case, take out the syringe, and give the injection to a diabetic person in a hypoglycemic coma. The glucagon shot can be given anywhere on the body, but usually the abdomen or the upper arm is easiest to get to. Typically, if this is a hypoglycemic reaction, the diabetic person will wake up within several minutes of getting the glucagon shot. This medication can be life-saving in a diabetic who is in a coma, or having a seizure and is otherwise totally uncooperative. Glucagon kits should be kept on hand for all individuals who have had serious hypoglycemic reactions or who take large doses of rapid acting insulin.

Serious hypoglycemic reactions are those reactions in which the symptoms include confusion, disorientation, coma or seizures and the individual needs help from another person to terminate the low blood sugar reaction. Serious hypoglycemic reactions imply that the nervous system is involved in the reaction. ANYTHING else is considered a "mild" reaction. As long as the individual can recognize what is going on, and treat their own symptoms, this is considered a "mild" reaction.

From a physician's perspective, we recognize that having occasional hypoglycemic reactions may be the price we pay for controlling diabetes with medications. Up to a couple "mild" reactions per month may be considered acceptable. However, serious hypoglycemic symptoms could potentially cause lasting damage, and having serious hypoglycemic reactions is UNACCEPTABLE in trying to achieve good control of diabetes. It takes little imagination to understand what could happen to a person driving a car or operating hazardous machinery were they to experience a serious hypoglycemic reaction.

Individuals with diabetes subject to hypoglycemic reactions need to take special precautions when driving a car or operating hazardous machinery. If an individual has a lapse of consciousness while driving a car, physicians are required by law to report

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these individuals to state Departments of Motor Vehicles. Good judgment dictates that such individuals should check their blood sugar levels prior to driving a car. They should carry with them snacks to eat if they are going to be driving for long periods of time. They should periodically pull over and check blood sugars if on a long road trip to prevent hypoglycemic reactions.

If you are a diabetic and traveling on your own, it is also important to carry some form of identification on your body indicating that you have diabetes and take medication to manage blood sugars. If you are involved in some kind of accident or problem, this information may save your life. Make sure to carry a list of your medications, the name and phone number(s) of your doctors, snacks, and an extra supply of medication in a second location if for instance your suitcase gets lost.

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