**HYPOGLYCEMIA (LOW BLOOD SUGAR)**

Throughout the day, depending on multiple different factors, blood sugar (also called blood glucose) levels will vary – up or down. This is normal. If it varies within a certain range, you probably won’t be able to tell. But if it goes below the healthy range and is not treated, it can get dangerous.

Low blood sugar (also known as hypoglycemia) is when your blood sugar levels have fallen low enough that you need to take action to bring them back to your target range. This is usually when your blood sugar is less than 70 mg/dL. However, talk to your diabetes care team about your own blood sugar targets, and what level is too low for you.

Low blood sugar may also be referred to as an insulin reaction, or insulin shock.

**Signs and symptoms of low blood sugar (happen quickly)**

Each person's reaction to low blood sugar is different. Learn your own signs and symptoms of when your blood sugar is low. Taking time to write these symptoms down may help you learn your own symptoms of when your blood sugar is low. From milder, more common indicators to most severe, signs and symptoms of low blood sugar include:

* Feeling shaky
* Being nervous or anxious
* Sweating, chills and clamminess
* Irritability or impatience
* Confusion
* Fast heartbeat
* Feeling lightheaded or dizzy
* Hunger
* Nausea
* Color draining from the skin (pallor)
* Feeling Sleepy
* Feeling weak or having no energy
* Blurred/impaired vision
* Tingling or numbness in the lips, tongue, or cheeks
* Headaches
* Coordination problems, clumsiness
* Nightmares or crying out during sleep
* Seizures

**The only sure way to know whether you are experiencing low blood sugar is to check your blood sugar, if possible. If you are experiencing symptoms and you are unable to check your blood sugar for any reason, treat the hypoglycemia.**

A low blood sugar level triggers the release of epinephrine (adrenaline), the “fight-or-flight” hormone. Epinephrine is what can cause the symptoms of hypoglycemia such as thumping heart, sweating, tingling, and anxiety.

If the blood sugar level continues to drop, the brain does not get enough glucose and stops functioning as it should. This can lead to blurred vision, difficulty concentrating, confused thinking, slurred speech, numbness, and drowsiness. If blood sugar stays low for too long, starving the brain of glucose, it may lead to seizures, coma, and very rarely death.

**Treatment - The "15-15 Rule"**

**The 15-15 rule—have 15 grams of carbohydrate to raise your blood sugar and check it after 15 minutes. If it’s still below 70 mg/dL, have another serving.**

Repeat these steps until your blood sugar is at least 70 mg/dL. Once your blood sugar is back to normal, eat a meal or snack to make sure it doesn’t lower again.

This may be:

* Glucose tablets (see instructions)
* Gel tube (see instructions)
* 4 ounces (1/2 cup) of juice or regular soda (not diet)
* 1 tablespoon of sugar, honey, or corn syrup
* Hard candies, jellybeans, or gumdrops—see food label for how many to consume

Make a note about any episodes of low blood sugar and talk with your health care team about why it happened. They can suggest ways to avoid low blood sugar in the future.

Many people tend to want to eat as much as they can until they feel better. This can cause blood sugar levels to shoot way up. Using the step-wise approach of the "15-15 Rule" can help you avoid this, preventing high blood sugar levels.

**Note:**

* Young children usually need less than 15 grams of carbs to fix a low blood sugar level: Infants may need 6 grams, toddlers may need 8 grams, and small children may need 10 grams. This needs to be individualized for the patient, so discuss the amount needed with your diabetes team.
* When treating a low, the choice of carbohydrate source is important. Complex carbohydrates, or foods that contain fats along with carbs (like chocolate) can slow the absorption of glucose and should not be used to treat an emergency low.

**Severe hypoglycemia**

When low blood sugar isn’t treated and you need someone to help you recover, it is considered a severe event.

**Treating severe hypoglycemia**

Glucagon is a hormone produced in the pancreas that stimulates your liver to release stored glucose into your bloodstream when your blood sugar levels are too low. Injectable glucagon is used to treat someone with diabetes when their blood sugar is too low to treat using the 15-15 rule.

Glucagon kits are available by prescription. Speak with your doctor about whether you should buy a glucagon kit and how and when to use it.

The people you are in frequent contact with (for example, friends, family members, and coworkers) should be instructed on how to give you glucagon to treat severe hypoglycemia.

[Find products for dealing with low blood glucose](http://www.diabetesforecast.org/2020/02-mar-apr/products-for-dealing-with-low.html)

**Steps for treating a person with symptoms keeping them from being able to treat themselves.**

1. Inject glucagon into the buttock, arm, or thigh, following the instructions in the kit.
2. When the person regains consciousness (usually in 5-15 minutes), they may experience nausea and vomiting.
3. If you have needed glucagon, let your doctor know so you can discuss ways to prevent severe hypoglycemia in the future.

**Don’t hesitate to call 911. If someone is unconscious and glucagon is not available or someone does not know how to use it, call 911 immediately.**

**Do NOT:**

* Inject insulin (it will lower their blood sugar even more)
* Provide food or fluids (they can choke)

**Causes of low blood sugar**

Low blood sugar is common for people with type 1 diabetes and can occur in people with type 2 diabetes taking insulin or certain medications. The average person with type 1 diabetes may experience up to two episodes of mild low blood sugar each week, and that’s only counting episodes with symptoms. If you add in lows without symptoms and the ones that happen overnight, the number would likely be higher.

**Insulin**

Too much insulin is a definite cause of low blood sugar. One reason newer insulins are preferred over NPH and regular insulin is that they’re less likely to cause blood sugar lows, particularly overnight. Insulin pumps may also reduce the risk for low blood sugar. Accidentally injecting the wrong insulin type, too much insulin, or injecting directly into the muscle (instead of just under the skin), can cause low blood sugar.

**Food**

What you eat can cause low blood sugar, including:

* Not enough carbohydrates
* Eating foods with less carbohydrate than usual without reducing the amount of insulin taken.
* Timing of insulin based on whether your carbs are from liquids versus solids can affect blood sugar levels.  Liquids are absorbed much faster than solids, so timing the insulin dose to the absorption of glucose from foods can be tricky.
* The composition of the meal—how much fat, protein, and fiber are present—can also affect the absorption of carbohydrates.

**Physical activity**

Exercise has many benefits. The tricky thing for people with type 1 diabetes is that it can lower blood sugar in both the short- and long-term. Nearly half of children in a type 1 diabetes study who exercised an hour during the day experienced a low blood sugar reaction overnight. The intensity, duration, and timing of exercise can all affect the risk for going low.

**Medical IDs**

Many people with diabetes, particularly those who use insulin, should have a medical ID with them at all times.

In the event of a severe hypoglycemic episode, a car accident, or other emergency, the medical ID can provide critical information about the person's health status, such as the fact that they have diabetes, whether or not they use insulin, whether they have any allergies, etc. Emergency medical personnel are trained to look for a medical ID when they are caring for someone who can't speak for themselves.

Medical IDs are usually worn as a bracelet or a necklace. Traditional IDs are etched with basic, key health information about the person, and some IDs now include compact USB drives that can carry a person's full medical record for use in an emergency.

**Hypoglycemia unawareness**

Very often, hypoglycemia symptoms occur when blood sugar levels fall below 70 mg/dL. As unpleasant as they may be, the symptoms of low blood sugar are useful. These symptoms tell you that you yourblood sugar is low and you need to take action to bring it back into a safe range. But, many people have blood sugar readings below this level and feel no symptoms. This is called hypoglycemia unawareness.

People with hypoglycemia unawareness can't tell when their blood sugar gets low so they don’t know they need to treat it. Hypoglycemia unawareness puts the person at increased risk for severe low blood sugar reactions (when they need someone to help them recover). People with hypoglycemia unawareness are also less likely to be awakened from sleep when hypoglycemia occurs at night. People with hypoglycemia unawareness need to take extra care to check blood sugar frequently. This is especially important prior to and during critical tasks such as driving. A continuous glucose monitor can sound an alarm when blood sugar levels are low or start to fall. This can be a big help for people with hypoglycemia unawareness.

Hypoglycemia unawareness occurs more frequently in those who:

* Frequently have low blood sugar episodes (which can cause you to stop sensing the early warning signs of hypoglycemia)
* Have had diabetes for a long time
* Tightly control their diabetes (which increases your chances of having low blood sugar reactions)

If you think you have hypoglycemia unawareness, speak with your health care provider. Your health care provider may adjust/raise your blood sugar targets to avoid further hypoglycemia and risk of future episodes.

**Regaining hypoglycemia awareness**

It’s possible to get your early warning symptoms back by avoiding any, even mild, hypoglycemia for several weeks. This helps your body re-learn how to react to low blood sugar levels. This may mean increasing your target blood sugar level (a new target that needs to be worked out with your diabetes care team). It may even result in a higher A1C level, but regaining the ability to feel symptoms of lows is worth the temporary rise in blood sugar levels.

**Other causes of symptoms**

Other people may start to have symptoms of hypoglycemia when their blood sugar levels are higher than 70 mg/dL. This can happen when your blood sugar levels are very high and start to go down quickly. If this is happening, discuss treatment with your diabetes care team.

**How can I prevent low blood sugar?**

Your best bet is to practice good diabetes management and learn to detect hypoglycemia so you can treat it early—before it gets worse.

Monitoring blood sugar, with either a meter or a continuous glucose monitor (CGM), is the tried and true method for preventing hypoglycemia. Studies consistently show that the more a person checks blood sugar, the lower his or her risk of hypoglycemia. This is because you can see when blood sugar levels are dropping and can treat it before it gets too low.

If you can, check often!

* Check before and after meals
* Check before and after exercise (or during, if it’s a long or intense session)
* Check before bed
* After intense exercise, also check in the middle of the night
* Check more if things around you change such as, a new insulin routine, a different work schedule, an increase in physical activity, or travel across time zones

**Why am I having lows?**

If you are experiencing low blood sugar and you’re not sure why, bring a record of blood sugar, insulin, exercise, and food data to a health care provider.  Together, you can review all your data to figure out the cause of the lows.

The more information you can give your health care provider, the better they can work with you to understand what's causing the lows. Your provider may be able to help prevent low blood sugar by adjusting the timing of insulin dosing, exercise, and meals or snacks. Changing insulin doses or the types of food you eat may also do the trick.