CONDITION

Drug-induced low blood sugar

Drug-induced low blood sugar happens when a medicine causes glucose in the blood to fall below a safe level.

WHAT IT IS
Abnormally low blood glucose caused by medicine

BODY SYSTEM
Hormones, brain, and nervous system

MAIN SYMPTOMS
Shaking, sweating, hunger, confusion

WHAT CAUSES IT
Medicines that increase insulin or lower glucose

HOW IT IS DIAGNOSED
Blood glucose testing and medicine review

MAIN TREATMENT
Fast-acting carbohydrate and medicine adjustment

CAN IT BE CURED?
Sometimes - resolves after medicine effects end

IS IT AN EMERGENCY?
Sometimes - if unconscious, seizing, or unable to swallow

LONG-TERM OUTLOOK
Usually good once the medicine plan is corrected

Overview

Drug-induced low blood sugar, or medication-induced hypoglycaemia, happens when a medicine causes blood glucose to fall too low. Glucose is the brain and body's main source of quick energy.

The condition most often affects people using insulin or medicines that make the pancreas release insulin. It can follow an excessive dose, a medication mix-up, reduced food intake, increased activity, or a change in how the body clears a medicine.

Some non-diabetes medicines can also cause low blood sugar, usually alongside another risk factor such as kidney disease, poor nutrition, or serious infection.

Mild episodes can usually be treated quickly. Severe hypoglycaemia can impair thinking,

swallowing, and consciousness, so prompt treatment is important. For many people with diabetes, a reading below 70 mg/dL, or 3.9 mmol/L, is treated as low. Symptoms can occur at a higher level if glucose is falling quickly.

Symptoms

Symptoms often begin suddenly. Early warning signs include:

As glucose falls further, the brain may not receive enough energy. This can cause confusion, unusual behaviour, slurred speech, severe drowsiness, seizures, or loss of consciousness.

Low blood sugar during sleep may cause sweating, restless sleep, nightmares, or a morning headache. Some people do not wake or notice warning signs.

Repeated episodes can cause impaired awareness of hypoglycaemia , meaning warning symptoms become weaker or appear only after confusion develops. This increases the risk of a severe episode.

Because symptoms such as sweating and dizziness have many causes, a glucose reading during symptoms helps confirm whether low blood sugar is responsible.

- Shaking, sweating, hunger, or a fast heartbeat
- Anxiety, irritability, tingling lips, or weakness
- Dizziness, blurred vision, headache, or poor concentration
- Unusual tiredness or poor coordination

Causes and risk factors

Insulin is the medicine most often linked with hypoglycaemia. Risk rises when the dose exceeds the body's needs, food is delayed, or activity increases glucose use.

Sulfonylureas and meglitinides make the pancreas release insulin. Their effects can continue after glucose first returns to normal, allowing hypoglycaemia to recur.

Metformin, GLP-1 receptor agonists, DPP-4 inhibitors, and SGLT2 inhibitors have a low risk when used alone. Risk may increase when they are combined with insulin or an insulin-releasing medicine.

Non-diabetes medicines associated with hypoglycaemia include quinine, pentamidine, and some fluoroquinolone antibiotics. Risk varies by medicine and individual circumstances.

Contributing factors include:

Beta blockers like metoprolol or propranolol may make tremor and a fast heartbeat less noticeable, although sweating may still occur. Do not stop them suddenly without medical advice.

- Missing, delaying, or eating less of a meal
- Vomiting, diarrhoea, fasting, or poor appetite
- More exercise or physical work than usual
- Drinking alcohol, especially without food
- Kidney or liver problems that slow medicine clearance
- Weight loss without a medication review
- Confusing different insulins, devices, or tablets
- Taking an extra dose or another person's medicine

Diagnosis

A low glucose meter or continuous glucose monitor reading during symptoms can identify an episode requiring treatment. Continuous monitors measure glucose in fluid under the skin and may lag behind blood glucose when levels change quickly. Use a finger-prick check when possible if the reading does not match how you feel.

Assessment considers symptom timing, glucose results, meals, activity, alcohol, and all medicines and supplements. Recent dose changes, new prescriptions, or reduced kidney function may reveal the cause.

For unexplained episodes, clinicians may look for Whipple's triad :

Laboratory testing may be needed if the diagnosis is uncertain, particularly in someone who does not use diabetes medicine. Tests may assess kidney and liver function, insulin, C-peptide, or other causes. Further investigation is needed if episodes continue after the suspected medicine is adjusted or stopped.

- Symptoms consistent with low blood sugar
- Low glucose measured during those symptoms
- Improvement after glucose is raised

Treatment and management

Treatment depends on whether the person is awake and can swallow safely.

If you are alert and able to swallow, take 15 to 20 grams of fast-acting carbohydrate, such as glucose tablets or gel, an ordinary sugary drink, or another measured source in your treatment plan. Check glucose again after about 15 minutes and repeat treatment if it remains low.

Chocolate and high-fat foods work more slowly and are not the best first treatment. After glucose recovers, have your planned meal or snack if the next meal is not soon.

Do not give food or drink to anyone who is unconscious, having a seizure, or unable to swallow safely. It could enter their lungs.

Glucagon is an emergency medicine available in injectable and nasal forms. Family, friends, or coworkers may be trained to use the prescribed product. Emergency help is still needed if the person does not recover promptly or hypoglycaemia may return.

Severe episodes may require glucose through a vein and extended monitoring in hospital. This is particularly important after long-acting insulin, sulfonylureas, an overdose, or when kidney function is reduced.

Long-term management involves identifying the cause and adjusting the medicine, timing, or diabetes plan. Do not reduce or stop prescribed medicine on your own unless an urgent care professional directs you to do so.

Complications

Confusion, blurred vision, and poor coordination can cause falls, burns, road crashes, or other injuries. Hypoglycaemia is especially dangerous during driving, swimming, working at height, or using machinery.

A prolonged severe episode can cause seizures, coma, brain injury, abnormal heart rhythms, or death. These outcomes are uncommon when low glucose is recognised and treated promptly.

Repeated episodes can reduce awareness of future lows and cause fear of exercise, sleep, driving, or medicine use. Hypoglycaemia may also return after initial recovery while a long-acting medicine remains active, particularly after sulfonylureas, long-acting insulin, overdose, or with reduced kidney function.

Prevention

Take medicines according to the written plan. Keep different insulins and similar-looking products separated, and check the label and dose before each use.

Monitor glucose as advised, especially around exercise, driving, illness, fasting, or meal changes. Continuous monitor alerts can warn of falling glucose, but you should still act on symptoms.

Carry a measured source of fast-acting carbohydrate. If glucagon is prescribed, keep it accessible and teach people close to you where it is and how to use it. Follow its expiry date and storage instructions.

Arrange a medication review after any severe episode, repeated lows, reduced food intake, weight loss, or change in kidney or liver function. Ask how alcohol, exercise, fasting for a procedure, and sick days affect your plan.

Living with it and what to expect

An episode caused by a clear medication error or temporary illness may not recur once the cause is corrected. Symptoms usually resolve after glucose returns to a safe level, although tiredness or headache may continue for several hours.

Risk can persist while the medicine remains active. Some insulins and insulin-releasing tablets work for many hours, and kidney or liver problems may prolong their effects.

People who continue using medicines associated with hypoglycaemia may have future episodes. Monitoring, dose reviews, meal planning, and preparation for activity can reduce risk. The plan may need to change with weight, appetite, kidney function, or daily routines.

Impaired warning awareness can sometimes improve after carefully avoiding low readings, usually with professional support and adjusted glucose targets. Most people can continue normal work, exercise, travel, and social activities, although driving, shift work, overnight activity, and long journeys may require extra planning.

When to get medical help

Call emergency services if someone with possible low blood sugar:

Place an unconscious person on their side if it is safe. Do not put food, drink, or objects in their mouth. Give glucagon if available and you have been shown how to use it.

Seek urgent medical advice after an episode caused by a sulfonylurea, long-acting insulin, or suspected medication error, even if glucose initially improves. Hypoglycaemia may return.

Arrange follow-up if episodes are becoming more frequent, happen during sleep, have no clear cause, or occur without warning symptoms. A medication review is also needed after changes

in appetite, weight, kidney function, activity, or alcohol use.

- Is unconscious, having a seizure, or unable to swallow
- Has severe confusion or cannot treat themselves safely
- Does not improve promptly after glucagon or repeated treatment
- May have taken an overdose or another person's medicine
- Has been injured during the episode

Common questions

Can a person without diabetes get drug-induced low blood sugar?

Yes. Non-diabetes medicines can sometimes cause hypoglycaemia, and diabetes medicines may be taken accidentally. Confirmed, unexplained low glucose in someone without diabetes needs medical assessment because medicines are only one possible cause.

Which diabetes medicines are most likely to cause it?

Insulin, sulfonylureas, and meglitinides carry the clearest risk because they provide insulin or make the pancreas release it. Other diabetes medicines rarely cause hypoglycaemia alone but may increase risk when combined with these treatments.

How long does medication-induced low blood sugar last?

A mild episode may improve within minutes after fast-acting carbohydrate. The risk of recurrence can last for hours or longer depending on the medicine, dose, food absorption, and kidney or liver function.

Can I go to sleep after treating a low reading?

Confirm that the low has resolved and follow your personal plan before sleeping. A low caused by long-acting medicine may return overnight. Seek urgent advice if the cause is unclear, treatment is not working, or lows repeat.

Should I stop the medicine that caused it?

Do not make a lasting change without medical advice. Stopping insulin or another essential medicine can create other risks. A clinician can safely adjust the dose, timing, or medicine.

Can low blood sugar happen even if my monitor looks normal?

Yes. Continuous monitors can lag behind blood glucose, and all devices have limits. If symptoms do not match the reading, use a finger-prick meter when possible and follow your safety plan. Persistent or severe symptoms require medical assessment.

Sources

- American Diabetes Association Professional Practice Committee. "Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes-2024." Diabetes Care . 2024;47(Supplement 1):S111-S125.
- Endocrine Society. "Management of Individuals With Diabetes at High Risk for Hypoglycemia: An Endocrine Society Clinical Practice Guideline." The Journal of Clinical Endocrinology & Metabolism . 2023;108(3):529-562.
- National Institute of Diabetes and Digestive and Kidney Diseases. "Low Blood Glucose (Hypoglycemia)." U.S. Department of Health and Human Services.
- Cryer PE, Axelrod L, Grossman AB, et al. "Evaluation and Management of Adult Hypoglycemic Disorders: An Endocrine Society Clinical Practice Guideline." The Journal of Clinical Endocrinology & Metabolism . 2009;94(3):709-728.
- Seaquist ER, Anderson J, Childs B, et al. "Hypoglycemia and Diabetes: A Report of a Workgroup of the American Diabetes Association and the Endocrine Society." Diabetes Care . 2013;36(5):1384-1395.
- U.S. Food and Drug Administration. "Drug Safety Communication: Updated Warnings for Fluoroquinolone Antibiotics on Significant Low Blood Sugar and Mental Health Side Effects." 2018.