

Hypoglycemia

Blood sugar dropped too low. Give glucose immediately. Figure out the cause afterward.

THE ONE-LINE TRUTH

Blood sugar below 70 mg/dL with symptoms, or below 55 mg/dL even without symptoms, means the brain and body are starving for fuel right now.

The chain — how it unfolds

1. Blood sugar drops below 70 mg/dL (or below 55 mg/dL even without symptoms). — why: Insulin overdose, sulfonylurea medicine, alcohol blocking the liver, liver or kidney failure, adrenal or pituitary failure, an insulin-making tumor, severe infection, or starvation breaks the system that keeps blood sugar steady. The brain and heart depend completely on sugar for fuel, so they send out an emergency alarm.
2. The adrenal glands release adrenaline (epinephrine) into the blood. — why: Adrenaline is the body's emergency signal to raise blood sugar fast and warn you something is wrong. It tells the liver to dump stored sugar and makes your heart race, your hands shake, and your skin sweat. These symptoms are the body's alarm, not the disease itself.
3. You feel shaky, sweaty, hungry, and your heart races (adrenergic symptoms). — why: Adrenaline floods your system to raise blood sugar and get your attention so you eat or get help. This is the body buying time before the brain runs out of fuel.
4. If blood sugar stays low, the brain itself starts to fail: you get confused, dizzy, weak, or have trouble speaking (neuroglycopenic symptoms). — why: The brain has no backup fuel and cannot make energy when blood sugar is too low. Brain cells in the cerebral cortex (the thinking and speaking part) and hippocampus (the memory center) fail first, so confusion and memory loss appear.
5. Blood sugar drops below 40 mg/dL: you have a seizure, lose consciousness, or fall into a coma. — why: Brain cells are starving and misfiring. The cerebral cortex cannot control movement or stay awake, so seizures or coma follow. The longer the brain starves, the more cells die.
6. Without treatment, permanent brain damage or death occurs. — why: Brain cells in the hippocampus and cortex die when they have no fuel for too long. Damage becomes permanent if blood sugar stays critically low for more than 30 to 60 minutes.

7. When you give glucose (by mouth, IV dextrose, or glucagon injection), blood sugar rises, the brain gets fuel again, and symptoms reverse—often in minutes. — why: Glucose is the fuel the brain and heart need. Once it arrives, brain cells make energy again, the emergency alarm (adrenaline) shuts off, and every symptom (shaking, confusion, seizure) stops. This rapid reversal proves low blood sugar was the true cause all along.

Spot it — what you see, and why

- Shakiness or trembling: When blood sugar drops, the adrenal glands (small triangle-shaped glands above the kidneys) dump out epinephrine (also called adrenaline, the body's alarm hormone). Epinephrine fires up muscles and makes them twitch and shake, getting the body ready to fight or run. This shake is the body's way of shouting 'we need fuel now.'
- Sweating without being hot: Epinephrine also turns on sweat glands all over the skin. The body treats low blood sugar like an emergency, so it starts sweating just like it would if you were in danger. This sweat is cold and clammy, not warm like when you exercise.
- Fast heartbeat or pounding in the chest: Epinephrine tells the heart to speed up and pump harder to push whatever glucose is left in the blood to the brain as fast as possible. The brain runs entirely on glucose (blood sugar), so the body protects it first when fuel runs low.
- Hunger that comes on suddenly: The hypothalamus (the brain's control center for hunger and many body needs) senses the drop in blood sugar and triggers a strong hunger signal. The body is demanding food to bring glucose levels back up quickly.
- Feeling dizzy, lightheaded, or confused: The brain uses glucose as its only fuel. When blood sugar falls too low, brain cells start to run out of energy. The parts that handle clear thinking, balance, and staying alert slow down first, like a phone going into low-power mode.
- Blurry vision or trouble seeing clearly: The parts of the brain that process what your eyes see (the occipital cortex at the back of the brain) need a steady glucose supply to work. When glucose drops, those areas can't fire correctly, so vision gets fuzzy or doubled.

Red flags — act now

- Confusion, slurred speech, or not acting like yourself (the brain is running out of fuel)
- Seizure or uncontrollable shaking (brain cells are firing wildly from severe glucose starvation)
- Loss of consciousness or cannot be woken up (immediate emergency — give glucagon injection or call 911)
- Low blood sugar (Hypoglycemia) happening often without a clear reason (may signal an insulin-producing tumor, adrenal failure, or liver disease)

- Severe low blood sugar after drinking alcohol (alcohol blocks the liver from making new glucose)

Treat it — in this order

1. 15–20 grams of fast-acting glucose by mouth (glucose tablets, juice, regular soda, honey) if the patient is awake and can swallow safely → Raises blood sugar directly within 10–15 minutes. The glucose goes straight from the stomach into the bloodstream and feeds the brain. Adrenaline shuts off, shaking stops, and confusion clears because the body has fuel again.
2. 25 grams of IV dextrose (one amp of D50 in 50 mL, given through a vein) if the patient cannot swallow, is unconscious, or is having a seizure → Bypasses the mouth and stomach and puts sugar directly into the bloodstream in seconds. Blood sugar rises fast, the brain wakes up, and seizures stop. This is the fastest way to save the brain when the patient cannot help themselves.
3. 1 mg glucagon injection (intramuscular or subcutaneous) if IV access is not available and the patient is unconscious → Tells the liver to dump stored glucose (glycogen) into the bloodstream. Blood sugar rises in 10–15 minutes without needing a vein. This is the home rescue option for severe low blood sugar (hypoglycemia) when paramedics are not there yet.
4. Recheck blood glucose 15 minutes after giving glucose; if still below 70 mg/dL, give another 15–20 grams and recheck again → Confirms the blood sugar came up and symptoms will stop. Prevents the blood sugar from crashing again before you fix the cause. Most patients need only one dose, but some need two or three if low blood sugar (hypoglycemia) is severe or caused by long-acting insulin.
5. Find and treat the cause: reduce or stop insulin or sulfonylurea dose, feed the patient regular meals and snacks, check liver and kidney function, treat infection or sepsis, stop alcohol, or give octreotide 50–100 micrograms subcutaneously every 6–12 hours if sulfonylurea overdose → Stops the upstream problem so low blood sugar (hypoglycemia) does not happen again. Octreotide blocks the pancreas from making insulin if a diabetes pill overdose is the culprit. Fixing the cause is the only way to prevent the next crash.

Your top priorities at the bedside

1. Check blood glucose with a fingerstick meter immediately, before giving any treatment — why: You must confirm low blood sugar (hypoglycemia) with a number under 70 because many conditions mimic the shaking and sweating (like anxiety or stroke); treating without checking wastes time if the diagnosis is wrong, and documenting the exact glucose level guides how much dextrose or glucose to give

2. Give 15 to 20 grams of fast-acting carbohydrate by mouth if the patient is awake and can swallow safely (4 glucose tablets, half cup of juice, or 1 tablespoon of sugar dissolved in water) — why: Glucose absorbed through the stomach reaches the bloodstream in 10 to 15 minutes and raises blood sugar about 30 to 50 points; simple sugar works faster than complex carbs like crackers because it needs no digestion, and this dose avoids overshooting into high blood sugar (hyperglycemia) (high blood sugar)
3. If the patient cannot swallow or is unconscious, establish IV access and push one amp of D50 (50 percent dextrose, 25 grams of sugar in 50 mL) over 3 to 5 minutes, or give 1 mg glucagon intramuscular injection if no IV is available — why: The brain suffers irreversible damage after 30 minutes without glucose, so IV dextrose delivers sugar directly to the bloodstream in under one minute; glucagon is a hormone that tells the liver to dump stored glycogen into the blood as glucose within 10 to 15 minutes when you cannot start an IV quickly