

Valproate Toxicity

A plain-English guide for you and your family

WHAT IS HAPPENING

Valproate is a seizure and mood medicine that works by turning up GABA, the brain's main calming signal, so electrical storms and mood swings stay quiet. Most people tolerate it fine. But in some—especially young children, people with certain gene changes, or anyone on multiple medications—valproate can poison the liver in a way that stops it from cleaning ammonia out of the blood. Ammonia is a waste product from breaking down protein; normally the liver grabs it and turns it into urea so it leaves in urine. When that system stalls, ammonia builds up and crosses into the brain, where it acts like a sedative, slowing thinking, alertness, and coordination. At the same time, valproate can inflame the pancreas, causing severe belly pain, nausea, and vomiting. The dangerous part is that all of this—confusion, sleepiness, even coma—can happen at doses the doctor thought were safe, because the toxicity comes from how your individual liver handles the drug, not just the dose on the bottle. Early signs include unusual tiredness, vomiting, confusion, shaky hands, or yellow skin. If caught early and the medicine is stopped, the liver and pancreas usually recover fully. The key is recognizing it fast, because untreated high ammonia can lead to permanent brain injury or death.

What you might feel

- Nausea and vomiting
- Confusion or drowsiness
- Tremor (shaking hands)
- Fast breathing (hyperventilation)
- Low blood pressure
- Coma or very deep sleepiness
- Liver damage (high liver enzymes, yellow skin or eyes)
- High ammonia level (hyperammonemia)

Call the doctor right away if...

- Coma or cannot wake the person up

- Yellow skin or eyes (jaundice), which means the liver is failing
- Very fast breathing or gasping, which may signal high ammonia or acid in the blood
- Seizures that keep happening or will not stop
- Bleeding that will not stop (valproate can lower platelets, the blood cells that form clots)

What the care team will do

- Check level of consciousness every 15 to 30 minutes using the Glasgow Coma Scale (a scoring system that measures eye opening, speech, and movement) and immediately notify the provider if the score drops or the patient cannot be awakened.
- Start two large-bore intravenous lines (IV catheters size 18 gauge or bigger) immediately and prepare to infuse L-carnitine 100 mg per kilogram (maximum 6 grams) over 30 minutes as ordered.
- Draw blood for ammonia level, complete blood count (a test that counts red cells, white cells, and platelets), liver enzymes (ALT and AST, which leak out when liver cells die), bilirubin (a yellow waste product that builds up in liver failure), and serum valproate level before giving any treatment.
- Place the patient on continuous pulse oximetry (a finger clip that measures oxygen) and capnography (a sensor that measures carbon dioxide in exhaled breath) if available, and watch for fast breathing rate above 20 breaths per minute.
- Hold all doses of valproate and check the medication administration record to make sure no nurse gives another dose by mistake.
- Monitor for signs of bleeding every 2 hours—check all IV sites, gums, nose, and skin for new bruises or pinpoint bleeding spots (petechiae) (tiny red dots from broken blood vessels)—and prepare to transfuse platelets if the count drops below 50,000 per microliter or if active bleeding starts.
- Insert a nasogastric tube (a flexible tube through the nose into the stomach) if the ingestion happened within 2 hours, the patient can protect their airway, and activated charcoal is ordered—give 50 grams mixed with water through the tube.
- Prepare the patient for urgent hemodialysis by notifying the dialysis team, ensuring IV access is secure, and explaining to the family that a temporary dialysis catheter (a large tube placed in the neck or groin vein) may be needed if valproate or ammonia levels stay dangerously high.

Medicines you may be given — and why

Stop valproate immediately

Valproate is the poison causing the toxicity, so the first step is to stop giving it so no more toxicity builds up. The body can then start clearing what's already inside.

L-carnitine

Valproate toxicity drains the body's stores of L-carnitine, a helper molecule the liver needs to burn fat for energy and to clear ammonia (a brain poison). Giving L-carnitine IV replaces what's missing, helps the liver work again, and lowers dangerous ammonia levels in the blood.

Activated charcoal

Activated charcoal is a fine black powder that acts like a sponge in the stomach and intestines. It binds to valproate pills or liquid that haven't been absorbed yet and traps them, so they pass out in the stool instead of entering the bloodstream.

Hemodialysis

Hemodialysis is a machine that filters the blood outside the body. It pulls valproate and other toxins out of the bloodstream much faster than the kidneys can, then returns the cleaned blood. This is life-saving when valproate levels are dangerously high or the person is so sick that waiting for the body to clear the drug naturally would take too long.

Supportive care for liver injury

Valproate toxicity can damage the liver, causing it to swell, stop making clotting factors, and leak enzymes into the blood. Supportive care means watching the liver closely with blood tests, giving IV fluids to keep blood pressure up, replacing clotting factors if bleeding starts, and supporting other organs (like the brain and kidneys) while the liver heals. There is no specific antidote for liver damage — the goal is to keep the person stable until the liver repairs itself.

Supportive care for pancreatitis

Valproate can inflame the pancreas (pancreatitis), causing severe belly pain, nausea, and vomiting. The pancreas needs complete rest to heal, so the person is not allowed to eat or drink (NPO) and gets IV fluids to stay hydrated. Pain is controlled with IV medications, and the pancreas is monitored with blood tests (lipase, amylase) and imaging (ultrasound or CT scan) to watch for complications like a fluid collection or infection.

Where this information comes from

- American College of Medical Toxicology (ACMT) valproate guideline

- International League Against Epilepsy (ILAE) 2022
- UpToDate clinical review on valproate toxicity
- Cochrane systematic reviews on antiepileptic drug safety

Last reviewed: 2026-07-07