

Guillain Barr Syndrome

Guillain-Barré is weakness that starts in the feet and climbs upward after an infection—watch closely for breathing trouble when it reaches the chest muscles.

THE ONE-LINE TRUTH

After an infection, the immune system attacks the myelin (the fatty wrap that insulates nerves), causing weakness that climbs from the feet upward and knocks out reflexes.

The chain — how it unfolds

1. After an infection, the immune system makes antibodies to fight the germ. — why: In Guillain-Barré, those antibodies accidentally cross-react with gangliosides (sugar-fat molecules) on the surface of peripheral nerve myelin, because some germs (especially *Campylobacter jejuni*) have similar surface molecules—this is called molecular mimicry.
2. Antibodies and immune cells (macrophages) attack the myelin wrapping on peripheral nerves. — why: The attack strips away myelin in patches (segmental demyelination), leaving bare nerve fibers that cannot carry fast electrical signals—like a wire with its insulation ripped off.
3. Weakness starts in the feet and legs, then climbs upward over hours to days. — why: The longest nerves—those running to the feet—are hit first and hardest, because they have the most myelin to attack; as more nerve fibers lose their wrap, the weakness ascends symmetrically into the thighs, trunk, arms, and face.
4. Deep tendon reflexes disappear (areflexia). — why: Reflexes need a fast round-trip signal: tap the tendon → sensory nerve fires → spinal cord → motor nerve fires back → muscle jerks. When myelin is stripped, the signal is too slow or blocked, so the reflex arc is broken and the muscle does not respond to the tap.
5. Patients feel tingling, numbness, or burning pain in the hands and feet. — why: Sensory nerve fibers are demyelinated too, so they fire randomly (causing tingling and pain) or stop firing (causing numbness); the nerve roots (radiculopathy) can also swell and hurt.
6. Breathing becomes shallow and weak when the weakness reaches the chest. — why: The phrenic nerve (controls the diaphragm) and intercostal nerves (control the rib muscles) lose their myelin, so the breathing muscles cannot contract forcefully—about 20–30 % of patients need a ventilator because their lungs cannot pull in enough air.

7. Heart rate and blood pressure swing wildly, and some patients sweat heavily or cannot control their bladder. — why: Autonomic nerve fibers (which control automatic body jobs like heart rate, blood pressure, sweating, and bowel/bladder) are demyelinated, so those systems lose stable control and fluctuate dangerously.
8. Most patients stop getting worse within four weeks, then slowly improve over months. — why: The immune attack eventually calms down, and the body begins to rebuild myelin around the nerve fibers (remyelination)—this process is slow, taking months to a year, and about two-thirds of people recover fully, though some are left with lasting weakness or numbness.

Spot it — what you see, and why

- Weakness that starts in the legs and climbs up: The immune system attacks the myelin (the protective coating around nerves, like insulation on a wire). When myelin is damaged, nerve signals slow down or stop, so muscles do not get their 'move' commands. The weakness usually starts at the feet and legs, then climbs toward the chest and arms over hours to days.
- Tingling or numbness in the hands and feet: The same immune attack damages sensory nerves (the wires that carry feeling signals to the brain). Sensory nerves often live in the same protective sheath as motor nerves, so they get hurt together. This causes pins-and-needles, tingling, or a numb feeling, usually starting in the toes and fingertips.
- Trouble walking or standing: Leg muscles are weak because nerve signals cannot reach them properly. Balance can also be off because sensory nerves that tell the brain where the feet are in space are damaged. Together, these make walking wobbly or impossible.
- Loss of reflexes (like the knee-jerk reflex): Reflexes are fast loops: a tap on the tendon sends a signal up a sensory nerve to the spinal cord, which fires a signal back down a motor nerve to make the muscle jerk. When myelin is stripped off these nerves, the loop is broken, so the reflex disappears.
- Pain in the back, legs, or muscles: Inflamed nerves send pain signals even without an injury. The immune attack and swelling around nerve roots (where nerves leave the spinal cord) can cause aching, burning, or sharp pain, often worse at night.
- Trouble breathing or swallowing: If the weakness climbs high enough, it reaches the nerves that control the diaphragm (the main breathing muscle under the lungs) and the muscles of the throat. When these muscles weaken, breathing becomes shallow and swallowing becomes unsafe because food or spit can slip into the windpipe.

Red flags — act now

- Trouble breathing, shortness of breath, or feeling like you cannot take a deep breath

- Trouble swallowing, drooling, or choking on food or water
- Weakness spreading to the chest, neck, or face within hours
- Heart racing, slowing, or skipping beats; blood pressure swinging high and low
- Cannot stand or walk at all, or weakness has reached both arms

Treat it — in this order

1. Intravenous immunoglobulin (IVIG) 2 g/kg divided over 5 days OR plasma exchange (5 exchanges over 10–14 days) → IVIG floods the blood with normal antibodies that block or dilute the attacking antibodies, calming the immune assault on myelin. Plasma exchange physically removes the attacking antibodies and inflammatory proteins from the blood. Both stop the nerve damage from getting worse and allow remyelination (regrowth of the nerve coating) to begin. Started early, they shorten the time to recovery and reduce the chance of needing a ventilator.
2. Intubation and mechanical ventilation if FVC < 20 mL/kg, NIF worse than -20 cm H₂O, or signs of respiratory fatigue → The ventilator takes over the work of breathing when the diaphragm and intercostal muscles are too weak to move enough air. This keeps oxygen levels safe and prevents carbon dioxide buildup, buying time for nerves to heal.
3. DVT prevention (prophylaxis) with sequential compression devices or subcutaneous heparin/enoxaparin → Paralyzed legs cannot squeeze blood back to the heart, so blood pools and clots form (deep vein clot formation (thrombosis)). Compression boots squeeze the calves mechanically; low-dose blood thinners keep clots from forming. This lowers the risk of a clot breaking off and traveling to the lungs (pulmonary a traveling clot lodging in a vessel (embolism)).
4. Pain control with gabapentin 300–900 mg three times daily or pregabalin 75–150 mg twice daily → Damaged nerve fibers misfire and send burning, shooting, or aching pain signals even though nothing is actually hurting the body. Gabapentin and pregabalin calm these misfiring nerves by blocking calcium channels in nerve endings, reducing neuropathic pain.
5. Continuous cardiac telemetry and autonomic support (IV fluids, atropine for a slow heart rate (bradycardia), short-acting pressors like phenylephrine for low blood pressure (hypotension)) → Monitors heart rhythm in real time and treats dangerous autonomic swings immediately. IV fluids raise blood pressure when it drops; atropine speeds the heart if it slows dangerously; pressors squeeze blood vessels to restore pressure. This prevents sudden cardiac arrest or stroke from wild swings.

Your top priorities at the bedside

1. Check forced vital capacity (FVC) or negative inspiratory force (NIF) every 4 hours and watch for shallow breathing, trouble speaking full sentences, or using neck muscles to breathe. — why: Respiratory failure is the most common cause of death in Guillain-Barré. The diaphragm (main breathing muscle) weakens as paralysis climbs upward. FVC below 20 mL per kg or NIF weaker than -30 means the patient needs intubation before they stop breathing completely.
2. Place patient on continuous cardiac monitor and check blood pressure every 2 hours, watching for heart rate below 50 or above 120, and blood pressure swings greater than 40 mmHg. — why: Autonomic dysfunction (damaged automatic nerve control) causes dangerous arrhythmias, a slow heart rate (bradycardia) (slow heart rate below 50), a fast heart rate (tachycardia) (fast heart rate above 100), and blood pressure that swings from very high to very low in minutes. Atropine (a heart-speed medicine) may not work, and some pressors (blood pressure medicines) can cause deadly arrhythmias.
3. Turn patient every 2 hours, keep heels off the bed with pillows, and apply sequential compression devices (SCDs) to both legs unless patient has clots already. — why: Paralyzed patients cannot move themselves and develop pressure ulcers (bed sores) within hours over the sacrum (tailbone), heels, and shoulder blades. Immobility plus hypercoagulable state (blood clots more easily) from IVIG raises a clot in a deep leg vein (deep vein thrombosis) (DVT) risk to 25 percent without prevention (prophylaxis) (prevention treatment).