

Syncope and Orthostatic Hypotension

Fainting (Syncope) and Orthostatic Low blood pressure (Hypotension)

THE ONE-LINE TRUTH

In fainting (syncope) and orthostatic low blood pressure (hypotension), the bedside team that catches the cluster early — standing blood-pressure check plus careful history plus an ECG — outperforms the team that orders every scan and waits.

The chain — how it unfolds

1. Blood flow to the brain drops below the critical threshold needed to keep you conscious. — why: Your brain has almost no oxygen reserve — it depends on constant delivery every single second. Normally mean arterial pressure (the average pressure pushing blood through one heartbeat, roughly diastolic plus one-third of the pulse pressure) is around 85–100 mmHg, and cerebral blood flow (perfusion) pressure (the pressure actually pushing blood into brain tissue, which equals mean arterial pressure minus the pressure inside your skull) stays above 60 mmHg. When mean arterial pressure falls below about 60 mmHg, or when your pressure drops so fast that the brain's autoregulation (the ability of brain arteries to widen and grab more flow) cannot keep up, blood flow to the cerebral cortex (the outer gray matter of your brain where thinking and consciousness live) slows to a trickle. Within 6–8 seconds, the cortex shuts off like a computer losing power — you lose consciousness and fall. Lying flat after the faint is the body's emergency fix: gravity is no longer fighting the flow, blood can reach your brain again without having to climb uphill, pressure recovers, and you wake up in 10–30 seconds (sometimes confused or sweaty, but awake).

2. The cause of the fainting (syncope) determines whether this is a one-time scare or the start of a dangerous spiral. — why: Vasovagal (reflex) fainting (syncope) usually resolves completely on its own once the vagus nerve calms down, your heart rate picks back up, and the trigger is gone — the patient wakes up, feels a little shaky or tired but otherwise fine, and there is no lasting harm to the heart or brain. Orthostatic low blood pressure (hypotension) from dehydration (a teenager who did not drink all day and fainted at sports practice) or from a new medicine (an older adult started on an alpha-blocker yesterday) improves quickly with simple fixes: drink more fluids and add salt, stop or lower the dose of the culprit drug, wear compression stockings to squeeze leg veins and push blood back up. But cardiac fainting — fainting caused by a heart-rhythm problem (complete heart block, ventricular a fast heart rate (tachycardia), long-QT syndrome) or a structural problem (severe aortic narrowing (stenosis), hypertrophic cardiomyopathy) — means the heart's dangerous defect is still there, waiting. The next faint could be the one that does not stop, spiraling into ventricular fibrillation (chaotic useless quivering) or asystole (complete electrical standstill) — sudden cardiac arrest and death within minutes unless someone starts CPR and shocks the heart.
3. If the root cause is not found and fixed, the patient cycles through repeated faints, and each cycle risks serious injury and makes the underlying problem worse. — why: Recurrent fainting (syncope) from undiagnosed heart block (the electrical wire between the top and bottom heart chambers is failing more each day) can suddenly progress to complete standstill (asystole) during the next episode — no heartbeat, no blood flow, brain damage or death in minutes. Recurrent orthostatic drops from autonomic failure (the squeeze reflex is dead and not coming back) lead to repeated falls: broken hip, fractured wrist, traumatic brain bleed from hitting your head on the floor, and a growing fear of standing or walking that traps you in a chair or bed (deconditioning — your muscles weaken, your bones thin, your balance gets worse, and the orthostatic response gets even weaker). Unrecognized bleeding (a slow oozing ulcer in your stomach, a small tear in your aorta that is leaking, a ruptured abdominal aortic aneurysm) keeps draining your blood volume; pressure drops lower with each passing hour, and eventually your kidneys and brain do not get enough oxygen — acute kidney injury, confusion, seizures, or full cardiac arrest before anyone realizes you are bleeding inside.

4. The care team's first job is risk stratification: quickly separate low-risk fainting (syncope) (safe to go home with instructions) from high-risk fainting (needs a hospital bed, a heart monitor, and urgent tests). — why: High-risk features flag the patients who might arrest in the next few hours or days and must be watched closely: age over 60, no early-warning phase (prodrome) or warning signs (you felt fine one second and woke up on the floor the next), fainting (syncope) during exercise or exertion, fainting while lying flat (gravity is not the cause, so something else like a rhythm is), chest pain or pressure before or after the faint, abnormal ECG (long QT interval over 460–480 ms, any degree of heart block, new bundle-branch block, Q waves showing old heart attack, Brugada pattern, very short PR with delta wave in Wolff-Parkinson-White, or frequent PVCs), history of heart failure or structural heart disease (aortic narrowing (stenosis), hypertrophic cardiomyopathy), or family history of sudden death before age 50 (suggests inherited arrhythmia syndrome like long QT, Brugada, or arrhythmogenic right ventricular cardiomyopathy). These patients need continuous telemetry monitoring (watching every heartbeat on a screen), an echocardiogram (ultrasound of the heart to see valve and muscle function), sometimes a stress test or electrophysiology study (threading wires into the heart to map abnormal electrical circuits), and sometimes cardiac catheterization if starved blood flow (ischemia) (blocked coronary arteries) is suspected. Low-risk patients (young and healthy, clear early-warning phase like feeling warm and nauseated first, obvious trigger like standing a long time or seeing blood, normal ECG, normal heart exam, normal orthostatic vitals or only mild drop, quick complete recovery) can often go home the same day with reassurance, simple instructions (drink more water, add a little extra salt unless you have high blood pressure or heart failure, avoid known triggers, learn to recognize the warning signs and sit or lie down immediately, do not stand still for long periods in the heat), and a plan to follow up with their regular doctor.

5. Early in the course, finding the broken step and fixing it with targeted therapy stops the spiral and prevents all the downstream harm. — why: Catching the cause early and treating it precisely prevents every bad outcome that would have followed. A patient with sick sinus syndrome (the heart's natural pacemaker is failing and letting the rate drop into the 30s) gets a permanent pacemaker implanted — a small device under the skin below the collarbone with wires running into the right heart chambers that takes over and paces the heart at a steady safe rate (usually set to keep it above 60 beats per minute) — fainting (syncope) stops immediately, and the risk of sudden death drops to nearly zero. A patient whose orthostatic low blood pressure (hypotension) started the day after a new alpha-blocker (tamsulosin for prostate symptoms) or a new blood-pressure pill gets the medicine stopped or dose cut in half — within days the vessel-squeeze reflex works again, orthostatic vitals normalize, dizziness disappears. A young woman with recurrent vasovagal fainting (faints every time she gets her blood drawn or stands in a hot shower too long) learns her triggers, starts drinking more fluids (goal 2–3 liters a day), adds a bit of salt (an extra half teaspoon unless her doctor says no), does leg exercises (crossing legs, squeezing thighs together, tensing calves) when she feels the early-warning phase (prodrome) coming on to push blood back up to her heart — fainting episodes drop from several a month to maybe one a year or none. A teenager who fainted after vomiting all night from a stomach bug gets a liter of intravenous normal saline (salt water) in the emergency department — volume is restored, pressure bounces back, she feels strong again and goes home the same day. An older adult with new heart failure whose loop diuretic dose was raised too high (dumping too much fluid and dropping pressure) gets the dose lowered and starts weighing himself daily (call the doctor if weight drops more than two or three pounds in a few days, a sign of too much diuretic) — balance is restored, no more fainting.

6. Late in the course — recurrent fainting (syncope) despite treatment, progressive structural heart disease, or autonomic failure from a neurodegenerative disease that will not reverse — the focus shifts to harm reduction and protecting the patient's safety and quality of life with what is left. — why: Some causes cannot be cured, only managed. A patient with advanced Parkinson's disease and severe autonomic failure (the nerves that control vessel squeeze have died and will not grow back) will never regain a normal orthostatic response; the treatment goal becomes preventing falls and keeping the patient as independent as possible: compression stockings (knee-high or thigh-high at 20–30 mmHg) squeeze the leg veins so less blood pools there, midodrine (a medicine that tightens blood vessels, taken three times a day, last dose at least four hours before bed so it does not raise lying blood pressure too much at night), fludrocortisone (a synthetic hormone like aldosterone that makes the kidneys hold onto salt and water to expand blood volume), sleeping with the head of the bed raised 30 degrees (keeps some blood in the upper body overnight so the drop is not as bad when you stand in the morning), eating smaller more frequent meals (big meals pull a lot of blood to the gut), avoiding very hot showers and baths, standing up in stages (sit at the edge of the bed for 30 seconds, then stand slowly), and a careful medication review to stop anything that might drop pressure further. The patient and family are taught warning signs and how to sit or lie down immediately; a physical therapist works on strength and balance to reduce fall risk; the home is made safer (grab bars, remove tripping hazards, good lighting). The patient will still have orthostatic symptoms, but the number of falls and injuries drops. A patient with recurrent ventricular a fast heart rate (tachycardia) (dangerous fast rhythm starting in the bottom chambers) despite the best medicines (amiodarone, beta-blocker) and an ablation procedure (burning the abnormal electrical focus with a catheter) gets an implantable cardioverter-defibrillator (ICD) — a device like a pacemaker but with the added ability to sense a life-threatening rhythm (V-tach, V-fib) and deliver a shock to reset the heart back to normal rhythm within seconds. The ICD does not prevent the V-tach from starting (the scar in the heart from an old tissue death from blocked blood flow (infarction) is permanent), but it stops sudden death — if the patient collapses from V-tach, the ICD shocks them back to life before brain damage occurs. Quality and length of life both improve.

7. The ultimate bad outcome — sudden cardiac death, severe traumatic brain injury from falling and hitting your head on concrete, or irreversible shock from unrecognized internal bleeding — happens when the diagnosis is missed, when the warning fainting (syncope) is brushed off as 'just a faint' or 'just got dizzy,' or when the patient never seeks care. — why: Fainting (Syncope) is a symptom, not a diagnosis — it is the body's alarm bell that something in the delivery system has failed. Every single faint deserves a systematic look. The highest-yield bedside test is orthostatic vital signs: measure blood pressure and heart rate lying flat after the patient has been still for five minutes, then have the patient stand and measure again at one minute and three minutes (positive if systolic drops 20 or more, diastolic drops 10 or more, or heart rate jumps 30 or more — in older adults a 30-beat jump alone suggests volume depletion, but in younger patients it can be normal, so the blood-pressure drop is more specific). A careful history is just as important: ask exactly what the patient was doing when it happened (standing, sitting, lying down, exercising, straining to poop, coughing hard), what they felt in the seconds before (prodrome: nausea, sweating, tunnel vision, chest pain, palpitations, or nothing at all), how long they were out (true fainting is brief, under a minute; longer suggests seizure or stroke instead), what they felt when they woke up (back to normal immediately, or confused and sore suggesting seizure), any witnesses (did they shake or bite their tongue, or just go limp and pale), all current medicines (especially new ones or dose changes in the last few weeks), past medical history (heart disease, diabetes, Parkinson's), and family history (any sudden unexplained death before age 50). An ECG (electrocardiogram, a 10-second tracing of the heart's electrical pattern) is mandatory in every fainting workup — it is quick, cheap, painless, and picks up lethal rhythms and structural clues (long QT, short QT, Brugada pattern, epsilon wave in arrhythmogenic right ventricular cardiomyopathy, heart block, old MI with Q waves, left ventricular hypertrophy from aortic narrowing (stenosis) or hypertrophic cardiomyopathy, pre-excitation in WPW). Missing a treatable cause — especially a cardiac rhythm or structural problem — means the patient walks out the door still carrying a time bomb. The next fainting episode might be their last: the teen with undiagnosed long-QT syndrome who faints again during gym class and this time does not wake up because the QT stretched into torsades de pointes and then v-fib; the older man with complete heart block sent home without a pacemaker who arrests in his sleep; the middle-aged woman with recurrent 'dizzy spells' whose ruptured abdominal aortic aneurysm was never imaged, bleeding slowly until she collapses in shock at home alone. Every missed fainting diagnosis is a missed chance to save a life.

Spot it — what you see, and why

- Sudden lightheadedness or feeling like you might faint: Blood pressure drops when you stand up, so less oxygen-rich blood reaches the brain. The brain needs a steady flow of oxygen to stay alert, and when it runs low for even a few seconds, you feel woozy or like the room is spinning.
- Brief loss of consciousness (passing out for less than a minute): When blood pressure falls too far or the heart pauses for a few beats, the brain shuts down for a moment to protect itself. You wake up quickly once you lie flat because gravity no longer pulls blood away from your head.
- Pale, cool, clammy skin: The body diverts blood away from the skin toward the brain and heart to keep them alive. Sweat glands also fire up as part of the autonomic nervous system's alarm response (the automatic system that runs heart rate and sweating), making you feel cold and sweaty.
- Vision tunneling or going gray or black: The retina at the back of the eye is one of the most oxygen-hungry tissues. When blood flow drops, the edges of your vision dim first, then the whole picture can go dark right before you faint.
- Nausea or feeling sick to your stomach: The vagus nerve (a long nerve that runs from the brainstem down to the gut) can fire hard during a fainting spell, slowing the heart and also stirring up the stomach, which makes you queasy.
- Fast or pounding heartbeat (palpitations): When blood pressure drops, the heart tries to catch up by beating faster to pump more blood per minute. You feel the racing pulse in your chest or neck as the body scrambles to keep oxygen moving.

Red flags — act now

- Fainting (Syncope) during exercise or while lying flat (may mean a dangerous heart-rhythm problem or a blocked valve)
- Chest pain, trouble breathing, or a very fast or very slow pulse with the faint (signals a serious heart issue)
- New fainting (syncope) in someone over 60 or anyone with known heart disease (higher chance of a life-threatening cause)
- Repeated fainting spells without a clear trigger, or loss of consciousness that lasts more than one to two minutes (needs urgent work-up for seizure, serious heart block, or a structural heart problem)
- Family history of sudden death before age 50 or known inherited heart conditions like long QT syndrome or hypertrophic cardiomyopathy (fainting may be the first sign of the same deadly rhythm problem)

Treat it — in this order

1. Immediate supine position (lying flat) or Trendelenburg (feet elevated 20 to 30 degrees) → Gravity pulls blood from the legs back toward the heart and brain within seconds, raising the pressure that pushes blood into the brain (cerebral blood flow (perfusion) pressure) without waiting for the heart to pump harder or vessels to tighten. Restores consciousness in most vasovagal or simple orthostatic fainting within 30 to 60 seconds.
2. IV normal saline bolus 500 milliliters to 1 liter over 15 to 30 minutes, then recheck blood pressure and heart rate → Expands blood volume, raising the amount of blood returning to the heart (preload), which increases stroke volume (how much the heart pumps with each beat) and cardiac output (total blood pumped per minute). Blood pressure rises and orthostatic symptoms resolve if dehydration or volume depletion is the broken step. Works within minutes.
3. Continuous cardiac monitor and 12-lead EKG within 10 minutes → Identifies rhythm disturbances (bradycardia—too slow, heart block—electrical signal blocked, atrial fibrillation (an irregular, quivering heartbeat)—chaotic top chambers, ventricular a fast heart rate (tachycardia)—fast dangerous rhythm from bottom chambers) in real time. Finding a correctable rhythm directs emergency treatment: atropine (speeds the heart by blocking the vagus nerve), transcutaneous pacing (electrical pads shock the heart to beat faster), adenosine (stops supraventricular a fast heart rate), or cardioversion (shock to reset the rhythm). EKG also shows starved blood flow (ischemia) (ST segment elevation or depression) that may need immediate cardiac catheterization.
4. Review and hold or reduce medicines that lower blood pressure or slow heart rate: diuretics (furosemide, hydrochlorothiazide), beta-blockers (metoprolol, carvedilol), ACE inhibitors (lisinopril), alpha-blockers (tamsulosin, doxazosin), nitrates, and sedatives → Removes the drug actively breaking the blood-pressure or heart-rate step. In medicine-induced orthostatic low blood pressure (hypotension), holding the offending medicine often restores stability within 12 to 24 hours as drug levels fall. Prevents fainting from happening again from the same medicine.
5. Treat the identified arrhythmia: atropine 0.5 to 1 milligram IV for symptomatic a slow heart rate (bradycardia); transcutaneous or transvenous pacing for complete heart block; adenosine 6 to 12 milligrams IV for supraventricular a fast heart rate (tachycardia); cardioversion or amiodarone for unstable ventricular a fast heart rate → Restores effective heart rhythm, which restores cardiac output and blood pressure. Atropine speeds the heart by blocking vagal brake signals. Pacing forces the heart to beat at a safe rate when its own electrical system fails. Adenosine or cardioversion stops a racing rhythm that does not let the heart fill with blood between beats.

Your top priorities at the bedside

1. Place patient flat or in Trendelenburg position (head down 20 degrees) immediately if blood pressure is low or patient feels faint — why: Gravity pulls blood back to the brain and heart when the head is level with or below the legs; this restores cerebral blood flow (perfusion) (brain blood flow) within seconds and prevents a second syncopal episode
2. Obtain full set of orthostatic vital signs: blood pressure and heart rate lying flat, then repeat at 1 minute and 3 minutes after standing — why: A drop of 20 mmHg systolic or 10 mmHg diastolic pressure when standing confirms orthostatic low blood pressure (hypotension); heart rate rising more than 30 beats per minute suggests volume depletion; these numbers guide fluid and medication decisions
3. Place patient on continuous cardiac monitor and obtain 12-lead EKG within 5 minutes — why: Arrhythmias such as a slow heart rate (bradycardia) (slow heart rate below 50), heart block (electrical signal failure), or ventricular a fast heart rate (tachycardia) (fast dangerous rhythm) cause fainting (syncope) and can kill; EKG shows starved blood flow (ischemia) (heart muscle low oxygen) and QT prolongation (risk for sudden death rhythm)