

Cardiogenic Shock

Cardiogenic shock means the pump itself has failed, and now every organ is starving for blood and oxygen.

THE ONE-LINE TRUTH

The heart muscle is so badly damaged that it cannot pump enough blood forward to keep the body's organs alive.

The chain — how it unfolds

1. The left ventricle muscle is badly damaged (usually by a large heart attack) and loses its squeeze strength. — why: Without enough living, contracting muscle, the heart cannot push blood forward—cardiac output drops sharply.
2. Blood pressure falls and organs begin to sense they are not getting enough oxygen. — why: Low cardiac output means less blood flow to every organ; sensors in the carotid arteries (neck arteries), kidneys, and brainstem detect the drop.
3. The sympathetic nervous system floods the body with epinephrine (adrenaline) and norepinephrine (noradrenaline); heart rate climbs and blood vessels squeeze tight. — why: The body tries to raise blood pressure and keep flow to the brain and heart by speeding the pump and tightening the pipes—even though the broken pump cannot keep up.
4. Blood is stolen from the skin, muscles, kidneys, and gut and sent to the brain and heart—hands and feet turn cold, pale, and sweaty. — why: Squeezed vessels in the arms, legs, and skin redirect the limited blood supply to the two organs that must not fail; cold, clammy skin is a visible sign of this redistribution.
5. Organs switch to working without oxygen (anaerobic metabolism), and lactic acid builds up in the blood. — why: Starved muscle and organ cells burn fuel without oxygen, producing lactate as waste—rising lactate is a chemical alarm that cells are suffocating.
6. The kidneys sense low flow, release renin (the enzyme that starts the kidney's emergency hormone chain) to hold onto salt and water, and stop making much urine; creatinine rises. — why: Low blood flow triggers the renin-angiotensin-aldosterone system to save every drop of fluid and keep blood volume up, but this also means the kidneys stop filtering waste—acute kidney injury begins.

7. The liver, gut, and lungs also begin to fail—liver enzymes rise, the gut may bleed or become blood-starved (ischemic) (not enough blood to feed it), and fluid backs up into the lungs causing pulmonary edema (fluid flooding the lungs) (water in the air sacs) and low oxygen. — why: Every organ depends on steady blood flow; as the pump weakens further, each organ shuts down in turn—this is multi-organ failure.
8. The brain, starved of oxygen and drowning in waste, causes confusion, agitation, or loss of consciousness. — why: Brain cells are extremely sensitive to low oxygen and low blood sugar—mental status change is often the first sign that shock is becoming irreversible.

Spot it — what you see, and why

- Blood pressure drops very low (top number under 90): The left ventricle (the heart's main pumping chamber) is too weak or damaged to squeeze hard enough to push blood out with normal force, so pressure in the arteries falls.
- Fast, weak pulse: The heart tries to beat faster to make up for the low amount of blood pumped with each beat, but each beat is weak because the heart muscle isn't squeezing well.
- Skin feels cold, clammy, and looks pale or bluish (especially fingers, toes, lips): Blood vessels in the skin tighten up (vasoconstriction) to send blood first to the brain and vital organs, so less blood reaches the skin; without enough oxygen-rich blood, skin turns cool and may look pale or blue.
- Breathing feels fast and hard, or the person is gasping for air: Blood backs up in the lungs because the weak left ventricle can't pump it forward, causing fluid to leak into the tiny air sacs (pulmonary swelling (edema) — water in the lungs), which makes it hard to breathe.
- Confusion, sluggish thinking, or loss of consciousness: The brain isn't getting enough oxygen-rich blood because the heart's pump is too weak, so thinking becomes foggy or the person may pass out.
- Urine output drops to almost nothing (less than half a cup per day for an adult): The kidneys need good blood flow to filter waste and make urine; when the heart can't pump enough blood, the kidneys slow down or stop working.

Red flags — act now

- Top blood pressure number stays below 90 even after giving fluids through an IV
- Person is confused, very drowsy, or unresponsive
- Skin is cold, sweaty, and gray or blue
- Urine output stops or drops to almost nothing for several hours

- Breathing is extremely fast, labored, or the person is gasping and can't speak in full sentences

Treat it — in this order

1. Norepinephrine intravenous (IV) infusion → Squeezes blood vessels to raise blood pressure and also strengthens each heartbeat so more blood reaches the brain, kidneys, and other organs. Buys time while you find and fix the broken part of the heart.
2. Emergency cardiac catheterization (threading a thin tube into the heart arteries through the wrist or groin) → Shows exactly which coronary artery is blocked. The team can open the artery immediately with a balloon and stent (percutaneous coronary intervention, PCI), restoring blood flow to dying muscle and often reversing the shock.
3. Inotropic drugs: dobutamine or milrinone IV (only if systolic BP is at least 80–85 mmHg) → Makes the weakened heart muscle squeeze harder and relax faster, so more blood moves forward with each beat. This improves organ blood flow without squeezing vessels as tightly as norepinephrine.
4. Mechanical circulatory support: intra-aortic balloon pump (IABP), Impella, or veno-arterial extracorporeal membrane oxygenation (VA-ECMO) → A device physically does some or all of the heart's pumping work. The balloon inflates between heartbeats to push blood forward; Impella is a tiny pump inside the heart; ECMO is a machine outside the body that pumps and adds oxygen. All of these give organs blood flow while you fix the heart or wait for it to recover.
5. Careful fluid management: give very little IV fluid, and remove extra fluid with diuretics (furosemide IV) if lungs are wet → Keeps the lungs from filling with fluid (which makes breathing harder and lowers oxygen) and prevents the weak heart from being flooded with extra volume it cannot pump.

Your top priorities at the bedside

1. Start continuous cardiac monitoring and measure blood pressure every 5 to 15 minutes using an automatic cuff or place an arterial line (a thin tube in the wrist artery for second-by-second pressure readings). — why: The heart is failing and blood pressure can drop suddenly to dangerously low levels; catching a pressure drop within minutes lets us increase norepinephrine or add mechanical support before organs die from lack of oxygen.
2. Place two large-bore IV catheters (thick needles) in separate arm veins and start norepinephrine infusion immediately, titrating (adjusting) the rate to keep systolic blood pressure at least 80 to 90 mmHg. — why: Norepinephrine squeezes blood vessels tight (vasoconstriction) to raise blood pressure quickly and keeps oxygen-rich blood flowing to the brain, heart, and kidneys; without it, organs shut down within minutes to hours.

3. Measure urine output every hour using a Foley catheter (a tube placed into the bladder) and report immediately if output drops below 0.5 milliliters per kilogram per hour (about 30 milliliters per hour for an average adult). — why: The kidneys need steady blood flow at pressures above 65 mmHg to filter waste and make urine; when urine stops, it means blood pressure is too low and kidneys are failing (acute kidney injury), requiring stronger medicines or mechanical pumps.