

Pericarditis

Pericarditis means the pericardium (the thin sac wrapped around the heart) is inflamed. The danger is that fluid can build up and squeeze the heart so it can't fill.

THE ONE-LINE TRUTH

The sac around the heart is swollen and irritated.

The chain — how it unfolds

1. The pericardium gets inflamed — why: A virus (like coxsackie), an autoimmune attack, uremic toxins from kidney failure, cancer cells, bacteria, or TB irritates the pericardial tissue, triggering an immune response that floods the area with inflammatory chemicals and white blood cells.
2. The layers rub and hurt — why: The inflamed pericardial surfaces lose their slippery coating and become rough and sticky, so with every heartbeat and every breath, the layers scrape together and fire pain signals from nerve endings in the outer layer — you feel sharp, stabbing chest pain that gets worse lying flat or breathing in and better sitting forward.
3. A friction rub appears — why: The rubbing creates a scratchy, leathery sound — the pericardial friction rub — that the doctor hears through the stethoscope, loudest at the left sternal border, often with three components matching heart contraction, relaxation, and atrial kick.
4. The EKG changes — why: Inflammation at the epicardium (the heart muscle's outer surface, which is the inner pericardial layer) disrupts electrical current flow, spreading it outward evenly instead of following normal pathways, so the EKG shows diffuse ST elevation across many leads and PR depression — a pattern that says 'surface inflammation' rather than 'blocked artery.'
5. Fluid leaks into the pericardial space — why: Inflamed capillaries in the pericardium become leaky and ooze fluid — sometimes clear, sometimes bloody, sometimes full of pus or protein — so the pericardial space swells from a few tablespoons to potentially liters, creating a pericardial fluid collection (effusion) visible on echocardiogram or chest X-ray.

6. The heart gets squeezed — why: If fluid builds faster than the pericardium can stretch, or if a lot accumulates, pressure in the sac rises above the pressure inside the heart chambers, squeezing them from the outside so they can't fill with blood — this is cardiac tamponade (the heart squeezed by fluid around it), and it chokes off the heart's pumping.
7. Blood pressure drops and organs starve — why: With the heart unable to fill, each beat pumps out very little blood (low stroke volume), so despite a fast heart rate, total blood flow (cardiac output) collapses, blood pressure falls, and the brain, kidneys, and other organs don't get enough oxygen — this is obstructive shock and a medical emergency.
8. Emergency drainage saves the heart — why: Removing even a small amount of fluid with a needle (pericardiocentesis) or surgically opening the sac (pericardial window) instantly drops the pressure, lets the heart fill again, and reverses shock — proving that every domino in the chain traced back to one thing: the inflamed, leaking pericardium.

Spot it — what you see, and why

- Sharp chest pain that gets worse when you lie flat and better when you sit up and lean forward: The pericardium (the thin sac wrapping the heart) is inflamed and rubbing against itself. When you lie flat, the heart presses harder on the sore sac. Sitting forward pulls the heart away from the chest wall and eases the rubbing.
- Chest pain that gets sharper when you take a deep breath, cough, or swallow: The inflamed pericardium rubs more when your lungs expand, your diaphragm (breathing muscle) moves, or your esophagus (food tube) shifts behind the heart. Each movement tugs on the sore tissue.
- A scratchy, squeaky sound (friction rub) when the doctor listens to your heart: The two layers of the pericardium are roughened by inflammation, so they scrape against each other with every heartbeat instead of gliding smoothly. This sound often comes and goes as the amount of fluid in the sac changes.
- Low-grade fever (usually under 100.4°F or 38°C): Your immune system is fighting the inflammation in the pericardium. White blood cells release chemicals called cytokines (signals that tell the body something is wrong), and these chemicals reset your internal thermostat slightly higher.
- Diffuse ST-segment elevation (the line after each heartbeat rises) on the EKG in almost all the heart's electrical zones, plus the PR segment dips down: Inflammation spreads across the entire pericardium, so the electrical signal from every part of the heart surface is affected at once. The ST rise shows injury current (like static from irritated tissue), and the PR dip comes from inflamed atrial tissue. This pattern is different from a heart attack, which only affects one artery's territory.

- Feeling tired and achy, like you have the flu: Inflammation anywhere in the body triggers cytokines (immune messenger chemicals) that make muscles sore and drain your energy. Your body is also working harder because every heartbeat now rubs against sore tissue.

Red flags — act now

- Fever above 100.4°F (38°C), especially if it won't come down — suggests infection inside the pericardium
- Large pericardial fluid collection (effusion) (more than 20 mm of fluid around the heart on ultrasound) — risk of tamponade
- Cardiac tamponade (the heart squeezed by fluid around it) signs: low blood pressure, bulging neck veins, muffled heart sounds, or pulsus paradoxus — the heart is being squeezed and can't pump
- Chest pain that does not improve when sitting forward, or pain that feels crushing like a heart attack — may be myopericarditis (heart muscle is inflamed too) or a different emergency
- Not getting better after one week of anti-inflammatory medicine, or symptoms come roaring back — suggests a tougher cause like tuberculosis, cancer, or autoimmune disease

Treat it — in this order

1. Nonsteroidal anti-inflammatory drug (NSAID) — ibuprofen 600–800 mg three times daily, aspirin 750–1000 mg three times daily, or indomethacin 25–50 mg three times daily for 1–2 weeks, then taper over 2–4 weeks → NSAIDs block cyclooxygenase (COX), the enzyme that makes prostaglandins — chemicals that cause pain and swelling. Stopping prostaglandins calms the inflamed pericardium so the two layers stop rubbing and the pain goes away. This treats the fire itself.
2. Colchicine 0.5 mg once daily (if weight < 70 kg) or twice daily (if weight ≥ 70 kg) for 3 months → Colchicine blocks tubulin, a protein that helps white blood cells move and release inflammatory signals. This stops the inflammation cascade deeper in the chain. Studies show colchicine cuts the chance of pericarditis coming back by half and speeds up recovery when started early with an NSAID.
3. Treat the upstream cause — dialysis for kidney failure, antibiotics (e.g. anti-tuberculosis therapy: isoniazid, rifampin, pyrazinamide, ethambutol) for bacterial or TB pericarditis, chemotherapy or radiation for cancer, steroids or disease-modifying drugs for autoimmune pericarditis → Stops the root problem that is setting the pericardium on fire. For example, dialysis clears uremic toxins from the blood; TB drugs kill the bacteria; autoimmune drugs calm the immune attack. Fixing the cause stops new inflammation from starting.

4. Pericardiocentesis — needle drainage of fluid from the pericardial sac — if signs of tamponade appear (low blood pressure, bulging neck veins, muffled heart sounds, pulsus paradoxus) or if a very large a fluid collection (effusion) is causing symptoms → Removes the fluid squeezing the heart so the chambers can fill and pump normally again. This restores blood pressure and oxygen delivery to the body. Tamponade is life-threatening; drainage must happen urgently.
5. Avoid corticosteroids (e.g. prednisone) as first-line therapy; reserve steroids for recurrent pericarditis that fails NSAIDs and colchicine, or for autoimmune or uremic pericarditis → Steroids calm inflammation powerfully, but when you stop them the inflammation often bounces back harder (called rebound). Using steroids early triples the recurrence rate. Reserving them for cases that truly need them keeps recurrence lower.

Your top priorities at the bedside

1. Check blood pressure and heart rate every 15 to 30 minutes until stable, watching for systolic pressure drop greater than 10 mmHg during inspiration (pulsus paradoxus). — why: Pulsus paradoxus (pressure dropping more than 10 mmHg when breathing in) signals tamponade (fluid squeezing the heart). Tamponade blocks venous return (blood coming back to the heart) during inspiration. Early detection allows time for life-saving pericardiocentesis (needle drainage).
2. Position the patient sitting upright or leaning forward over a bedside table to reduce chest pain. — why: Leaning forward moves the heart away from the inflamed posterior pericardium (back part of the heart sac). Lying flat presses the heart against the inflamed tissue and increases pain. Comfort improves breathing depth and reduces anxiety.
3. Assess for Beck triad every 2 to 4 hours: listen for muffled or distant heart sounds, check neck veins for distention, and measure blood pressure for low blood pressure (hypotension) (low pressure). — why: Beck triad signals cardiac tamponade (the heart squeezed by fluid around it) (fluid under pressure in the pericardial sac). Tamponade restricts diastolic filling (heart relaxation and filling phase), dropping cardiac output (blood pumped per minute). Missing this can lead to obstructive shock and cardiac arrest.