

Cardiac Tamponade

A plain-English guide for you and your family

WHAT IS HAPPENING

Your heart sits inside a thin sac called the pericardium. Normally that sac holds only a couple tablespoons of fluid to keep things sliding smoothly. When blood, pus, or extra fluid pours into that sac faster than it can stretch — from infection, cancer, a torn blood vessel, kidney failure, or chest injury — the pressure climbs. The sac becomes a tight wrapper squeezing all four heart chambers at once, like shrink-wrap around a water balloon. The chambers cannot open wide to fill with blood, so each heartbeat pumps less. Blood backs up in the veins. The pulse gets weak. Blood pressure drops. The person feels short of breath, dizzy, and scared. The body tries to fix it by speeding up the heart and holding onto fluid, but that only buys minutes. If the fluid is not drained quickly with a needle or surgery, the heart will stop. Once the fluid is out, the heart can fill again and the person gets better fast. This is why recognizing the pattern early — big neck veins, quiet heart sounds, and dropping blood pressure — can save a life.

What you might feel

- Blood pressure drops, especially when breathing in (pulsus paradoxus)
- Neck veins bulge and stay swollen (jugular venous distention)
- Heart sounds turn quiet and muffled
- Trouble breathing or feeling short of breath (dyspnea)
- Heart beats fast (tachycardia, often over 100 beats per minute)
- Chest pain or pressure
- Feeling dizzy, lightheaded, or confused
- Weak, thready, or hard-to-feel pulse
- Cool, clammy, pale skin (signs of poor blood flow (perfusion))

Call the doctor right away if...

- Blood pressure dropping below 90 systolic or falling fast despite fluids
- Confusion, loss of consciousness, or not responding normally

- Pulsus paradoxus greater than 10 mmHg (big drop in systolic pressure when breathing in)
- Oxygen levels dropping below 90% or severe trouble breathing
- Signs of shock: cold clammy skin, fast weak pulse, pale or blue color, and altered mental state

What the care team will do

- Place the patient on continuous cardiac monitoring and pulse oximetry, and measure blood pressure every 5 to 15 minutes.
- Start two large-bore intravenous lines (18-gauge or larger) and give a rapid bolus of 500 to 1,000 mL of 0.9% normal saline over 10 to 20 minutes if blood pressure is dropping.
- Keep the patient sitting upright at 45 degrees or higher, and avoid laying them flat.
- Prepare immediately for pericardiocentesis by gathering the drainage kit, ultrasound machine, sterile gloves and drapes, local anesthetic like lidocaine, and cardiac arrest supplies including a defibrillator.
- Give high-flow oxygen by nasal cannula or non-rebreather mask to keep oxygen saturation above 92%, but avoid bag-mask ventilation or intubation unless the patient stops breathing.
- Assess for pulsus paradoxus by measuring the difference between systolic blood pressure during inspiration (breathing in) and expiration (breathing out); report if the drop is greater than 10 mmHg.
- Check neck veins with the head of the bed raised to 30 to 45 degrees; look for jugular venous distention (JVD) that stays swollen even when sitting up.
- Hold all blood-thinning medications including heparin, enoxaparin, warfarin, and antiplatelet drugs like aspirin or clopidogrel, and notify the provider immediately.

Medicines you may be given — and why

IV normal saline (0.9% sodium chloride solution)

This salt-water solution fills your blood vessels quickly. When the sac around your heart squeezes it, the heart chambers shrink and hold less blood. By pouring more fluid into your veins, we boost the pressure pushing blood back into the heart. This extra pressure helps the heart fill a little better—even though the outside squeeze is still there—so each beat pumps out a bit more blood to your body. Think of it like turning up water pressure in a garden hose that someone is pinching: you cannot remove the pinch yet, but higher pressure forces more water through. This buys time until the fluid around the heart is drained.

Norepinephrine (Levophed)

Norepinephrine squeezes the muscle layer in the walls of your arteries and veins, making the vessels narrower. When vessels narrow, blood pressure climbs—like crimping a hose raises the pressure inside. In tamponade, even though the heart is being squeezed and cannot fill well, higher blood pressure helps push blood through vital organs like your brain, kidneys, and the heart muscle itself. It also raises the pressure that drives blood back to the heart.

Norepinephrine is used when IV fluids alone are not enough to keep blood pressure safe while you wait for the pericardial drain.

Dobutamine

Dobutamine lands on beta-1 adrenergic receptors on heart muscle cells and tells them to contract more forcefully. Even when the heart chambers are being squeezed from outside and cannot fill well, dobutamine helps each heartbeat push out as much blood as possible from the small amount that does get in. Think of it like pressing harder on a sponge that is already squeezed—you wring out every drop you can. It is used in tamponade mainly when the heart is very weak or when blood pressure stays low despite fluids and vessel-squeezing drugs.

Antibiotics (examples: vancomycin plus ceftriaxone or cefepime, chosen based on suspected bacteria)

If the tamponade is caused by bacterial infection in the pericardial sac (called pus-filled (purulent) or bacterial pericarditis), antibiotics kill the bacteria making the infected fluid. Bacteria have cell walls or protein factories that human cells do not. Antibiotics target those parts—some punch holes in bacterial walls (like ceftriaxone and cefepime), others jam the bacteria's machinery for building walls or making proteins (like vancomycin). Once the bacteria die, the infection stops, new fluid production slows, and your body can start to clear the fluid. Antibiotics do NOT drain the fluid themselves; drainage is still needed. But they stop new fluid from forming and keep the infection from spreading to your blood or other organs.

NSAIDs (nonsteroidal anti-inflammatory drugs, such as ibuprofen, indomethacin, or aspirin at high dose)

If the tamponade is caused by inflammation of the pericardium (pericarditis from a virus, autoimmune disease, or unknown trigger), these drugs calm the immune response that is making the sac swell and leak fluid. NSAIDs block an enzyme called cyclooxygenase (COX) that makes prostaglandins—chemical messengers that trigger inflammation, pain, and fluid leakage. When prostaglandins drop, swelling decreases, pain eases, and the pericardium stops oozing fluid. NSAIDs are used after the fluid is drained to prevent it from building up again. They are taken for weeks to months, depending on the cause.

Colchicine

Colchicine disrupts the tiny tubes (microtubules) inside immune cells that act as their skeleton and railroad tracks. Without working microtubules, white blood cells cannot travel to the pericardium, cluster there, or dump out inflammatory chemicals. This cools down the immune attack on the pericardial sac, slows fluid production, and cuts the chance that fluid will build up again after drainage. It is used alongside NSAIDs for pericarditis and is especially good at preventing recurrences (fluid coming back weeks or months later). Treatment usually lasts three months.

Corticosteroids (such as prednisone or methylprednisolone)

Corticosteroids are powerful drugs that shut down many immune pathways at once. They slip into cells and turn off genes that make inflammatory chemicals (cytokines, prostaglandins, leukotrienes). This calms severe or autoimmune-driven pericardial inflammation that does not respond to NSAIDs and colchicine alone. Steroids are used when pericarditis is caused by lupus, rheumatoid arthritis, or other autoimmune diseases, or when other anti-inflammatory drugs have failed or cannot be used. They are NOT first-line because they raise the risk of the fluid coming back after you stop them.

Where this information comes from

- ESC Guidelines on Pericardial Diseases 2015
- AHA/ACC Pericardial Disease Guidelines
- American College of Cardiology
- UpToDate Clinical Reference

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