

Hfpef

Heart failure with preserved ejection fraction (HFpEF) means the heart pumps normally but its walls are stiff, so it cannot relax and fill between beats. SGLT2 inhibitors (like empagliflozin or dapagliflozin) and mineralocorticoid receptor antagonists (MRAs like spironolactone) help; other heart failure medicines are less proven here.

THE ONE-LINE TRUTH

The heart squeezes fine but cannot relax and fill with blood the way it should.

The chain — how it unfolds

1. The left ventricle becomes thick and stiff from years of high blood pressure, diabetes, obesity, and aging. — why: High pressure forces the muscle to work harder and grow thicker, but instead of staying flexible, the walls stiffen and lose their ability to relax between beats.
2. The stiff ventricle cannot relax and fill with blood normally, so pressure builds up behind it in the left atrium and pulmonary veins (the blood vessels bringing blood from the lungs). — why: When the ventricle resists filling, blood has nowhere to go but backward, so it pools in the lungs and raises the pressure there.
3. Fluid leaks from the lung blood vessels into the air sacs (alveoli), causing shortness of breath, especially with exercise. — why: The backup pressure pushes fluid across the thin walls of the capillaries (tiny blood vessels in the lungs) into the spaces where oxygen exchange happens, so less oxygen reaches the blood and the person feels breathless.
4. The body holds onto salt and water to try to fill the stiff ventricle harder, but this extra fluid spills into the legs, ankles, and belly, causing swelling (edema). — why: The kidneys sense lower oxygen delivery and activate the renin-angiotensin-aldosterone system, which tells the body to keep sodium and water—but because the heart cannot pump it all forward, the fluid backs up into the tissues.
5. The left atrium stretches from chronic high pressure and begins to beat irregularly, leading to atrial fibrillation (an irregular, quivering heartbeat). — why: Stretched atrial muscle develops abnormal electrical circuits that fire chaotically, overriding the normal pacemaker and causing an irregular, often rapid heartbeat.

6. Atrial fibrillation (an irregular, quivering heartbeat) worsens symptoms because the ventricle loses the atrial kick (the extra push from the atrium's squeeze), so it fills even less and cardiac output drops. — why: In HFpEF, the stiff ventricle depends heavily on that final atrial squeeze to fill; without it, filling pressure must climb even higher or the person feels more tired and short of breath.
7. Blood pooling in the fibrillating atrium can form clots, which may break off and travel to the brain, causing a stroke. — why: When the atrium quivers instead of squeezing, blood swirls and stagnates, especially in a pouch called the left atrial appendage, and clots form in that slow-moving blood.
8. Every symptom—shortness of breath, fatigue, swelling, irregular heartbeat, risk of stroke—traces back to one upstream break: a stiff left ventricle that cannot relax and fill. — why: Fixing the stiffness (or at least slowing its progression) is the target of SGLT2 inhibitors, MRAs, blood pressure control, weight loss, and exercise—because all the dominoes fall from that single broken piece.

Spot it — what you see, and why

- Shortness of breath during activity or when lying flat: The left ventricle (the heart's main pumping chamber) becomes stiff and doesn't relax well between beats, so it can't fill up with enough blood. This causes blood to back up into the lungs (like water pooling behind a dam), making the lungs heavy and hard to expand.
- Swelling in the ankles, legs, or belly: Because the stiff heart can't handle all the blood coming back from the body, pressure builds in the veins. Fluid gets pushed out of the blood vessels and into the surrounding tissues, causing visible puffiness (edema).
- Feeling unusually tired or weak, especially with effort: The stiff heart can't pump enough oxygen-rich blood forward to the muscles and organs when you move or work. Your body feels like it's running on a low battery because the cells aren't getting the fuel they need.
- Fast or irregular heartbeat (palpitations): The heart tries to beat faster to make up for the fact that each beat doesn't move as much blood as it should. Over time, the strain on the atria (the heart's upper chambers) can also trigger atrial fibrillation (an irregular, quivering heartbeat) (a chaotic, quivering rhythm).
- Needing to urinate more often at night: During the day, fluid pools in your legs because of gravity. When you lie down at night, that fluid flows back into the bloodstream and the kidneys filter it out as urine. This is the body's way of unloading the extra fluid the heart can't handle.
- Sudden, severe shortness of breath with pink, frothy spit: This is a sign of acute pulmonary edema (fluid flooding the lungs)—fluid has suddenly flooded the air sacs in the lungs. The stiff heart can't keep up with incoming blood, pressure spikes in the lung vessels, and fluid leaks into the spaces where oxygen is supposed to pass into the blood.

Red flags — act now

- Sudden, severe shortness of breath with pink or bloody spit (sign of fluid filling the lungs)
- New or worsening chest pain, especially during activity (may signal a heart attack or dangerous lack of blood flow)
- Confusion, dizziness, or passing out (brain and body aren't getting enough oxygen)
- Rapid weight gain (more than 2–3 pounds in a day or 5 pounds in a week) or sudden increase in leg or belly swelling (sign that fluid is building up fast)
- Heart rate over 120 beats per minute at rest, or a new irregular rhythm (may be atrial fibrillation (an irregular, quivering heartbeat) or another dangerous arrhythmia)

Treat it — in this order

1. Loop diuretic — furosemide (Lasix) or torsemide — to remove extra fluid → Pulls salt and water out of the blood through the kidneys, shrinking the fluid load the stiff heart has to deal with. Pressure drops in the veins and lungs, so shortness of breath and swelling improve within hours to days.
2. SGLT2 inhibitor — empagliflozin (Jardiance) or dapagliflozin (Farxiga) → Blocks sugar reabsorption in the kidneys, so you pee out sugar, salt, and water. Lowers blood sugar, shrinks fluid load, helps you lose weight, and directly improves how the stiff left ventricle relaxes and fills. Large trials (EMPEROR-Preserved, DELIVER) show fewer hospitalizations and better survival in HFpEF.
3. ACE inhibitor (lisinopril, enalapril) or ARB (losartan, valsartan) to control blood pressure → Blocks angiotensin II (a hormone that squeezes blood vessels and makes the heart work harder). Blood vessels relax, so the heart pumps against less resistance. Over months to years, this slows the buildup of stiffness and fibrosis in the ventricle wall.
4. Mineralocorticoid receptor antagonist (MRA) — spironolactone or eplerenone — if potassium and kidney function are safe → Blocks aldosterone (a hormone that makes blood vessels and heart muscle stiff and tells the kidneys to hold onto salt and water). Reduces fibrosis in the heart and blood vessels, lowers fluid overload, and may improve long-term outcomes (TOPCAT trial showed benefit in some HFpEF patients).
5. Beta-blocker (metoprolol, carvedilol) or non-dihydropyridine calcium channel blocker (diltiazem, verapamil) for rate control if atrial fibrillation (an irregular, quivering heartbeat) is present → Slows the heart rate so the stiff left ventricle has more time to fill between beats. In HFpEF with AFib, filling time is critical — if the heart races, the ventricle never fills and pressure backs up instantly. Target resting heart rate 60–80 bpm.

Your top priorities at the bedside

1. Weigh the patient daily at the same time wearing similar clothing, and report weight gain of three pounds in one day or five pounds in one week to the provider immediately — why: Weight is the most reliable early sign of fluid overload because extra fluid adds body weight before swelling becomes visible; catching fluid buildup early prevents lung congestion and hospital readmission
2. Monitor intake and output closely, aiming for negative fluid balance when the patient has signs of fluid overload like swelling or shortness of breath — why: The kidneys hold onto salt and water in heart failure because low cardiac output (blood pumped per minute) makes the body think it is dehydrated; tracking how much fluid goes in versus comes out helps us adjust diuretic doses to remove extra fluid safely
3. Elevate the head of the bed at least thirty degrees and keep extra pillows at the bedside for patients with shortness of breath — why: Gravity pulls fluid down and out of the lungs when the patient sits upright, improving gas exchange (oxygen moving into blood); the stiff heart in HFpEF cannot handle the extra blood volume that flows back when lying flat