

Stable CAD and Chronic Angina

A plain-English guide for you and your family

WHAT IS HAPPENING

Your heart is a pump that never stops, and it needs its own steady blood supply through three main arteries that wrap around it like a crown (that's why we call them coronary arteries). When you are resting, those arteries deliver just enough oxygen-rich blood to feed the heart muscle. But when you climb stairs, shovel snow, or get excited, your heart has to pump harder and faster — so it needs more fuel. In stable coronary artery disease (CAD), fatty plaque (a mix of cholesterol, calcium, and scar tissue) builds up on the inside walls of those arteries, making them narrower, like rust clogging a pipe. At rest, enough blood can still squeeze through. But when you exercise and your heart muscle demands more oxygen, the narrowed artery cannot deliver it — the muscle gets starved, and you feel chest pain or pressure (doctors call this angina). The pain goes away when you rest or take a nitroglycerin pill, because demand drops back down and the trickle of blood is enough again. Your body is not broken everywhere — just that supply line. The good news: we can protect you with daily medicines (aspirin to keep clots from forming, a statin to shrink plaque and calm inflammation, and blood-pressure pills to ease the workload), plus lifestyle changes (quit smoking, move more, eat less saturated fat). If medicines are not enough and the narrowing is severe, a cardiologist can open the artery with a tiny balloon and stent (percutaneous coronary intervention, or PCI) or a surgeon can bypass the clog with a new vessel (coronary artery bypass graft, or CABG). The goal is simple: make supply meet demand again, so your heart never runs out of oxygen.

What you might feel

- Chest pressure or tightness that starts with effort and stops with rest
- Pain or heaviness that spreads to the left arm, jaw, neck, or back
- Shortness of breath during activity
- Symptoms that go away within a few minutes of stopping the activity
- Symptoms triggered the same way each time — for example, always after climbing two flights of stairs or walking uphill
- Relief within minutes of taking nitroglycerin under the tongue
- A resting EKG that looks normal

- Chest pain that happens at rest, lasts longer than usual, or comes on with less effort than before

Call the doctor right away if...

- Chest pain that starts at rest or wakes you from sleep
- Pain that lasts longer than 10–15 minutes or does not go away with rest or nitroglycerin
- New shortness of breath at rest, sweating, nausea, or feeling like you might pass out
- Pain that is suddenly much worse or comes on with far less effort than your usual pattern

What the care team will do

- Teach the patient to call 911 if chest pain lasts more than five minutes after taking one sublingual nitroglycerin tablet or if pain is worse than usual.
- Check blood pressure at every visit and teach the patient to monitor blood pressure at home weekly.
- Confirm the patient takes aspirin eighty-one milligrams and a high-dose statin every day and knows why these medicines prevent heart attacks.
- Teach proper use of sublingual nitroglycerin: sit down, place one tablet under the tongue, wait five minutes, take a second tablet if pain continues, then call 911 if pain lasts after the second dose.
- Assess for signs of heart failure at each visit: ankle swelling, weight gain of more than three pounds in one day, shortness of breath when lying flat, and fatigue.
- Review the patient's daily activity level and teach that regular walking for thirty minutes five days a week improves blood flow and reduces chest pain.
- Screen for depression and anxiety at every visit using a simple two-question screen: feeling down or hopeless, and loss of interest in activities.
- Teach the patient to avoid sudden heavy lifting or shoveling snow because these activities spike blood pressure and oxygen demand quickly.

Medicines you may be given — and why

Aspirin 81 mg (low-dose baby aspirin)

Aspirin stops tiny blood cells called platelets from sticking together and forming clots inside the coronary arteries (the arteries that feed the heart muscle). When plaque is already built up in these arteries, even a small clot can plug the narrow opening and cause a heart attack. Aspirin keeps the blood flowing smoothly by blocking an enzyme in platelets called COX-1

(cyclooxygenase-1), which prevents the platelets from making thromboxane A₂, the sticky signal that tells platelets to clump.

High-intensity statin (atorvastatin 40-80 mg or rosuvastatin 20-40 mg)

Statins lower the amount of LDL cholesterol (the bad cholesterol that builds plaques) in your blood by blocking an enzyme in the liver called HMG-CoA reductase. This enzyme is the liver's cholesterol factory. When you block it, the liver makes much less cholesterol and pulls LDL cholesterol out of the blood to use instead. Lower LDL slows plaque growth, stabilizes existing plaques (makes them less likely to crack open), and cuts the risk of heart attack and stroke. The goal LDL for people with stable CAD is below 70 mg/dL, or below 55 mg/dL if your risk is very high.

ACE inhibitor (e.g., lisinopril, ramipril) or ARB (e.g., losartan, valsartan)

ACE inhibitors and ARBs both block the renin-angiotensin-aldosterone system (RAAS), the body's main blood pressure and fluid control system. Angiotensin II is a powerful chemical that tightens blood vessels and raises blood pressure. ACE inhibitors stop angiotensin II from being made by blocking the ACE enzyme. ARBs block the receptors where angiotensin II tries to work. Either way, blood vessels relax, blood pressure drops, and the heart does not have to pump as hard. These drugs also protect the heart muscle, kidneys, and blood vessel lining. They are especially important if you also have high blood pressure, diabetes, reduced heart pump function (ejection fraction below 40%), or a history of heart attack.

Beta-blocker (e.g., metoprolol, atenolol, carvedilol)

Beta-blockers are the first-choice medicine to prevent and control angina (chest pain). They block beta receptors in the heart, which are the landing spots for adrenaline (epinephrine) and noradrenaline (norepinephrine). When adrenaline hits these receptors, your heart beats faster and harder, which makes the heart muscle demand more oxygen. By blocking adrenaline's signal, beta-blockers slow the heart rate, lower blood pressure, and reduce how hard the heart squeezes. This cuts the heart's oxygen demand, so the narrowed coronary arteries can keep up and chest pain happens less often. Beta-blockers also protect against dangerous heart rhythms and are especially important if you have had a heart attack or have reduced heart pump function.

Calcium channel blocker (CCB) (e.g., amlodipine, diltiazem, verapamil)

Calcium channel blockers are a second-choice medicine for angina if a beta-blocker does not work well enough or causes side effects you cannot tolerate. They block calcium channels in heart muscle cells and the smooth muscle cells that line blood vessel walls. Calcium is the spark that makes these muscles squeeze. By blocking calcium from entering, CCBs relax the heart and widen blood vessels. This lowers blood pressure, reduces how hard the heart has to work, and increases blood flow through the coronary arteries. Some CCBs (like diltiazem and

verapamil) also slow the heart rate, similar to beta-blockers. Others (like amlodipine) mainly relax blood vessels.

Long-acting nitrate (e.g., isosorbide mononitrate, isosorbide dinitrate)

Long-acting nitrates relax and widen blood vessels, especially veins and the coronary arteries. They release nitric oxide (NO), a gas signal that tells smooth muscle in blood vessel walls to relax. This reduces the amount of blood returning to the heart (preload) and the pressure the heart pumps against (afterload), so the heart does less work and needs less oxygen. Widening the coronary arteries also improves blood flow to the heart muscle. Long-acting nitrates are taken once or twice a day to prevent angina, but they must be dosed with a nitrate-free interval (usually overnight) to avoid tolerance (where the drug stops working).

Ranolazine

Ranolazine is used for chronic angina that does not get better with standard medicines like beta-blockers, calcium channel blockers, or nitrates. It works by blocking late sodium channels in heart muscle cells. Normally, a little sodium keeps leaking into heart cells even after they contract, and this extra sodium triggers extra calcium to come in. Too much calcium makes the heart muscle stiffer and raises pressure inside the heart, which squeezes the small blood vessels that feed the heart muscle and worsens angina. By blocking late sodium flow, ranolazine reduces calcium overload, relaxes the heart muscle, lowers pressure inside the heart chambers, and improves blood flow to the heart muscle. It does not slow the heart rate or lower blood pressure much, so it can be added to other angina medicines.

Sublingual nitroglycerin (under-the-tongue quick spray or tablet)

Sublingual nitroglycerin is a rescue medicine for sudden angina attacks. It works the same way as long-acting nitrates—it releases nitric oxide, which relaxes blood vessels—but it acts in 1–3 minutes because it absorbs directly into the bloodstream under your tongue. It widens the coronary arteries (improving blood flow to the heart muscle) and veins (reducing the amount of blood returning to the heart), so the heart's workload and oxygen demand drop quickly and chest pain goes away. You take one dose at the first sign of chest pain, wait 5 minutes, and if pain persists, take a second dose. If pain is still there after a third dose (15 minutes total), call 911—you may be having a heart attack.

Where this information comes from

- AHA/ACC 2023 Chronic Coronary Disease Guideline
- ESC 2019 Chronic Coronary Syndromes Guideline
- UpToDate
- NEJM

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