

Coronary artery disease (CAD)

Section 1 of 6: The basics

Understand coronary artery disease, symptoms, testing, treatment, and daily care.

What should I do now?

Call 911

Call 911 for new or unexplained chest pressure that lasts more than a few minutes or returns, especially with sweating, nausea, breathlessness, or faintness. Do not drive yourself.

Contact your care team

Contact your care team promptly for a change in your usual symptom pattern, reduced exercise tolerance, or medication problems. New or persistent chest symptoms need acute assessment.

Keep your care plan

Keep your treatment and follow-up plan. Bring questions, readings, and your medication list.

SECTION 1

What is coronary artery disease?

Your heart pumps blood to your body, but the heart muscle also needs its own blood supply. The vessels that provide this blood are called the coronary arteries. They run along the surface of the heart and deliver the oxygen and nutrients the muscle needs to work.

Coronary artery disease, or CAD, usually develops when plaque builds up within the walls of these arteries. Plaque contains cholesterol, fats,

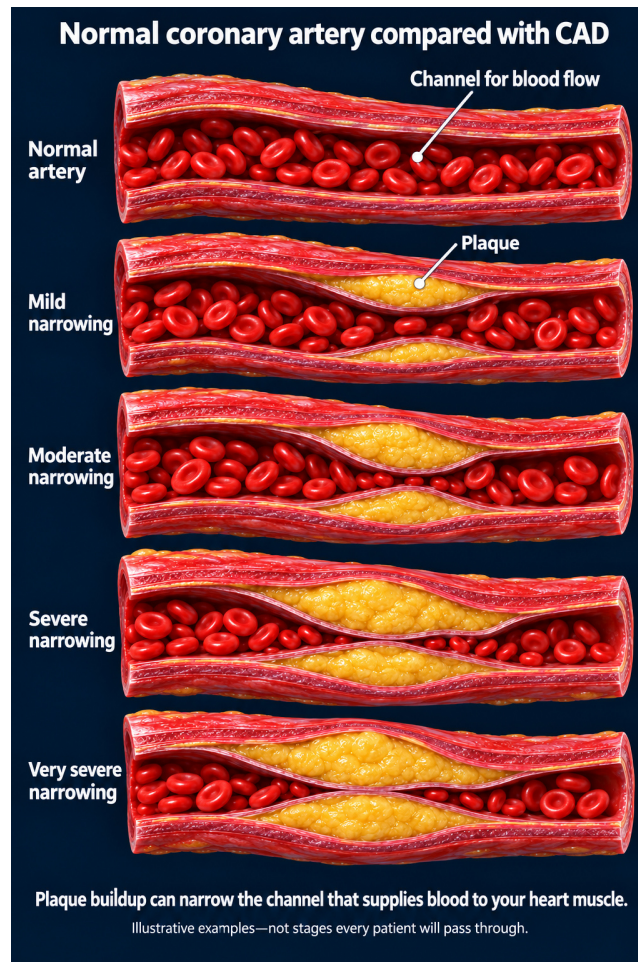
calcium, and other substances. This process is called atherosclerosis.

How does plaque affect blood flow?

A healthy coronary artery has an open channel that allows blood to reach the heart muscle. As plaque accumulates, it can narrow that channel and limit blood flow.

When you exercise or experience stress, your heart needs more oxygen. A narrowed artery may not deliver enough blood to meet that increased demand. This can cause angina - discomfort from an inadequate blood supply to the heart muscle.

CAD can also be present without noticeable symptoms, especially before a narrowing significantly affects blood flow.



These realistic cutaway illustrations compare a normal artery with increasing amounts of plaque narrowing the channel for blood flow. They are illustrative examples, rather than stages every patient will pass through.

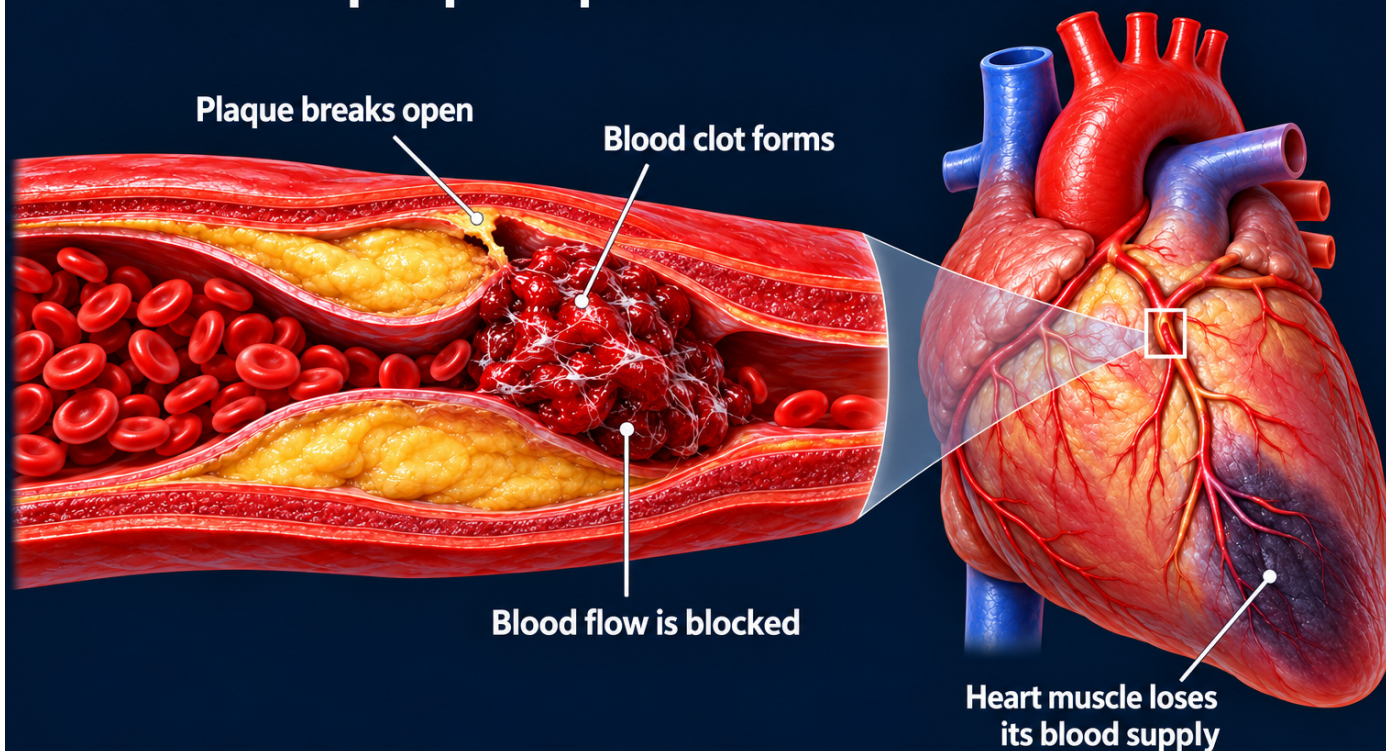
How can CAD cause a heart attack?

Sometimes the surface of a plaque breaks open. A blood clot can form at that location, suddenly reducing or blocking blood flow.

If blood flow is not restored quickly, the heart muscle supplied by that artery can become damaged or die. This is a heart attack, also called a myocardial infarction, or MI.

A plaque does not have to cause a severe narrowing before it breaks open. This is why treatment focuses on the health of your arteries and reducing future risk, as well as treating important blockages.

How a plaque rupture can cause a heart attack



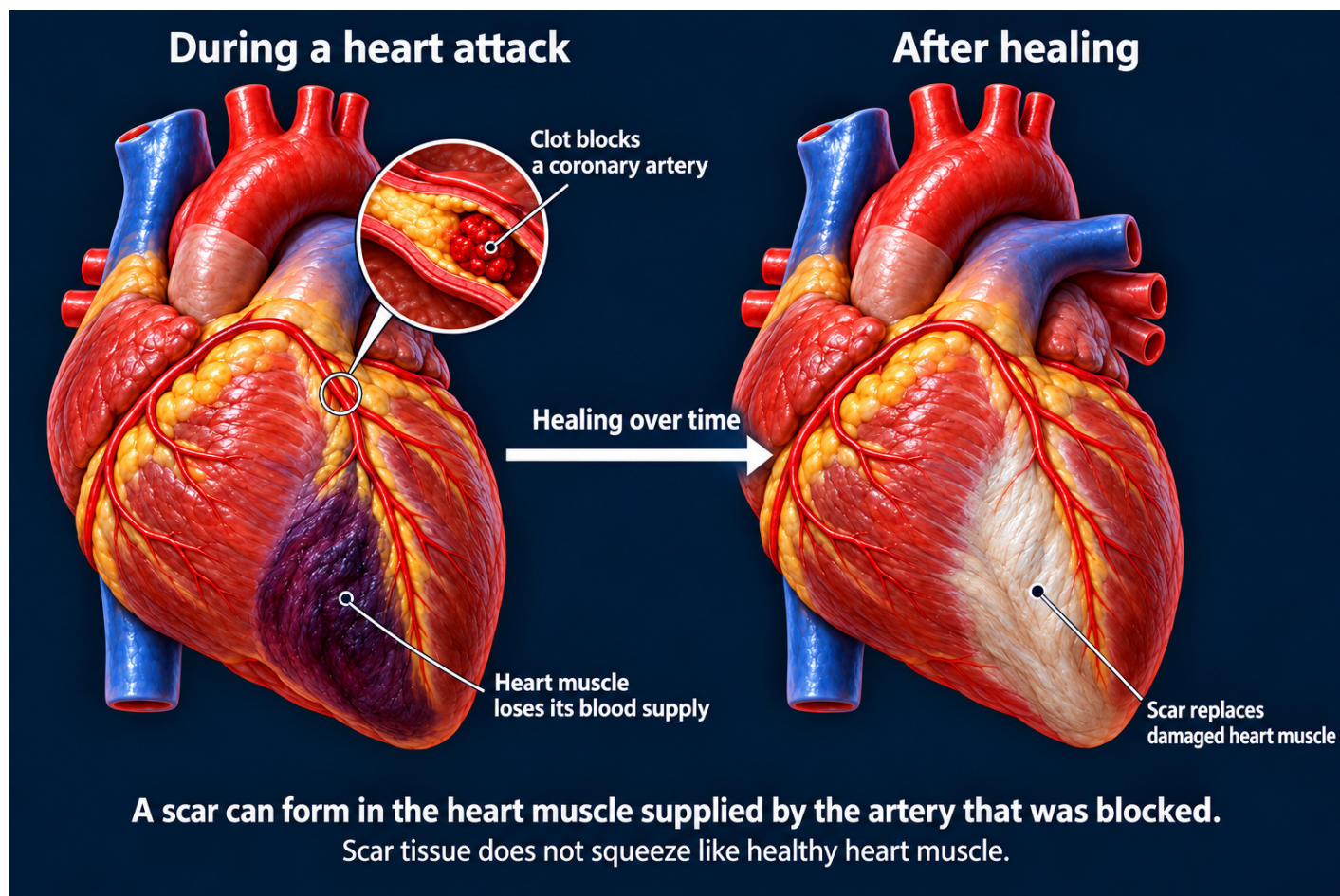
A clot at a ruptured plaque can block oxygen-rich blood and cause a heart attack.

A blood clot can form where a plaque breaks open. If it blocks the coronary artery, the heart muscle beyond the blockage loses its oxygen supply and a heart attack can occur.

What happens to the heart after a heart attack?

An injured area of heart muscle may heal with scar tissue. Scar does not squeeze as well as healthy muscle, so a larger heart attack can weaken the heart's pumping function.

The amount of damage depends on the area affected and how quickly blood flow is restored. Early treatment can help limit heart damage.



After a heart attack, scar tissue can replace damaged heart muscle in the area supplied by the blocked artery. Scar tissue does not squeeze like healthy heart muscle.

What increases the risk of CAD?

Common risk factors include:

- High LDL cholesterol
- High blood pressure
- Tobacco use
- Diabetes
- Physical inactivity and excess weight
- Increasing age
- A family history of early CAD

Some risk factors are inherited. Others can improve with treatment and healthy habits.

Can CAD be treated?

Yes. Treatment can reduce symptoms and lower the risk of future heart attacks. It may include medications, lifestyle changes, and - for selected patients - a stent or bypass surgery.

CAD generally requires ongoing care. Even after a procedure improves blood flow, medications and risk-factor management remain important for protecting your heart.

Coronary artery disease (CAD)

Section 2 of 6: Symptoms

Understand coronary artery disease, symptoms, testing, treatment, and daily care.

SECTION 2

What symptoms can CAD cause?

CAD can cause symptoms when the heart muscle does not receive enough oxygen-rich blood. Some people have no symptoms, while others notice discomfort or reduced stamina.

Common symptoms

- Chest discomfort: Pressure, tightness, squeezing, heaviness, or burning.
- Discomfort outside the chest: Discomfort may spread to the shoulders, arms, neck, jaw, back, or upper abdomen.
- Shortness of breath: Especially with walking, climbing stairs, or exercise.
- Unusual fatigue: Feeling more tired during everyday activities.

Symptoms may appear during physical activity or emotional stress, when your heart needs more oxygen.

What is stable angina?

Angina is discomfort caused by an inadequate blood supply to the heart muscle. Stable angina usually follows a familiar pattern - for example, discomfort when walking uphill that improves within a few minutes with rest or prescribed medication. Tell your cardiologist about these symptoms.

When could symptoms signal a heart attack?

Warning signs include new or worsening chest discomfort, discomfort at rest, shortness of breath, a cold sweat, nausea, or lightheadedness. Symptoms may develop gradually or come and go.

If you think you may be having a heart attack, call 911 immediately - even if you are unsure. Do not drive yourself or wait for an office appointment.

Can CAD be present without chest pain?

Yes. CAD can be silent, or cause shortness of breath or fatigue instead of chest pain. Heart attack symptoms may be mild or absent, especially in older adults and people with diabetes.

Coronary artery disease (CAD)

Section 3 of 6: Diagnosis

Understand coronary artery disease, symptoms, testing, treatment, and daily care.

SECTION 3

How is CAD diagnosed?

Your doctor starts by reviewing your symptoms, medical history, family history, and risk factors. A physical examination and blood tests - including cholesterol and blood sugar - help guide the evaluation.

Different tests answer different questions. Some look for plaque or narrowing, while others assess blood flow or heart muscle injury. You may not need every test.

EKG and blood tests

An electrocardiogram, also called an EKG or ECG, records the heart's electrical activity.

When a heart attack is suspected, the medical team also checks blood tests such as troponin, a marker of heart muscle injury. These results help determine whether urgent treatment is needed.

Stress testing

A stress test evaluates your heart during exercise or with medication that changes its workload or blood flow.

Depending on the test, your doctor may use an EKG, ultrasound, or nuclear imaging - such as SPECT or PET - to look for areas receiving an inadequate blood supply.

Treadmill stress test



During a treadmill stress test, the team monitors your heart's response to exercise.

Nuclear stress test

Heart blood-flow imaging



Nuclear stress testing uses a small amount of radioactive tracer and a special camera to compare blood flow to the heart muscle at rest and during stress. Stress may be produced by exercise or medication.

Coronary CT angiography

Coronary CT angiography, or CCTA, uses a CT scanner and contrast dye to create detailed pictures of the coronary arteries. It helps your doctor look for plaque and narrowing.

Coronary calcium scan

A calcium scan measures calcium within plaque in the coronary artery walls. It can help assess cardiovascular risk and guide prevention decisions.

A calcium score is not a percentage blockage. This scan measures calcified plaque rather than directly showing how much blood reaches

the heart muscle.

Cardiac catheterization and coronary angiography

For selected patients, your doctor may recommend a coronary angiogram. A thin catheter is guided through a blood vessel to the heart, and contrast dye with X-ray imaging outlines the coronary arteries.

This helps identify important narrowings and guide decisions about medications, a stent, or bypass surgery.



A coronary angiogram uses contrast dye and X-rays to outline the coronary arteries. This example shows access through an artery at the wrist.

Looking for heart muscle damage

An echocardiogram or cardiac MRI may also be used to evaluate the heart muscle. Cardiac MRI can show areas of scarring after a heart attack.

Coronary artery disease (CAD)

Section 4 of 6: Treatment options

Understand coronary artery disease, symptoms, testing, treatment, and daily care.

SECTION 4

How is coronary artery disease treated?

Treatment has three main goals:

- Reduce the risk of a heart attack.
- Improve symptoms and daily activity.
- Restore blood flow when a procedure is needed.

Your plan depends on your symptoms, the location and severity of narrowing, your heart's pumping function, and your overall health. Not every narrowing requires a stent or surgery.

1. Protecting your arteries

Healthy habits and risk-factor treatment are the foundation of CAD care - even after a stent or bypass surgery.

This includes stopping tobacco use, eating a heart-healthy diet, staying active at a level approved by your care team, and managing weight, blood pressure, cholesterol, and diabetes.

Cholesterol-lowering medications

Statins are usually the first medication used to lower LDL cholesterol in patients with CAD. Examples include atorvastatin and rosuvastatin.

Some patients also need another medication, such as ezetimibe or a PCSK9 inhibitor, to reach their cholesterol goal. These treatments remain

important even when you feel well.

Medications that reduce clot formation

Your doctor may prescribe an antiplatelet medication, such as aspirin, to help prevent blood clots.

After a heart attack or stent, patients often need aspirin plus another antiplatelet medication, such as clopidogrel, ticagrelor, or prasugrel. This is called dual antiplatelet therapy.

Your doctor determines the combination and duration by balancing protection from clots against bleeding risk. Do not stop these medications without speaking with your prescribing team.

2. Relieving angina

Medications can help reduce chest discomfort and improve your ability to be active.

Depending on your situation, your doctor may prescribe:

- Beta blockers: Reduce heart rate and the heart's workload.
- Calcium channel blockers: Help relieve angina.
- Nitrates, including nitroglycerin: Help relieve chest discomfort.
- Other antianginal medicines: May be added if symptoms continue.

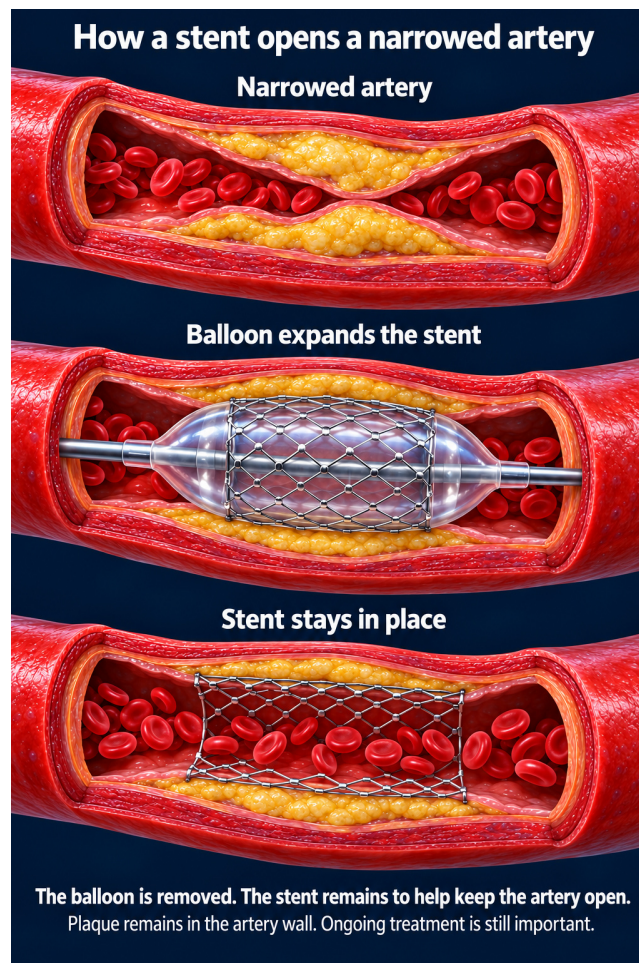
Your doctor chooses medications based on your symptoms, blood pressure, heart rate, and other conditions.

3. Opening an artery with a stent

A stent is a small metal mesh tube placed inside a coronary artery to hold a narrowed area open.

During the procedure, a catheter carries a balloon and stent to the narrowing. The balloon expands the stent against the artery wall. The balloon is removed, and the stent stays in place to support blood flow.

Many stents release medication that helps reduce tissue growth and repeat narrowing.



The balloon expands the stent against the artery wall. After the balloon is removed, the stent remains to support the open channel. Plaque remains in the wall, so ongoing CAD treatment is still important.

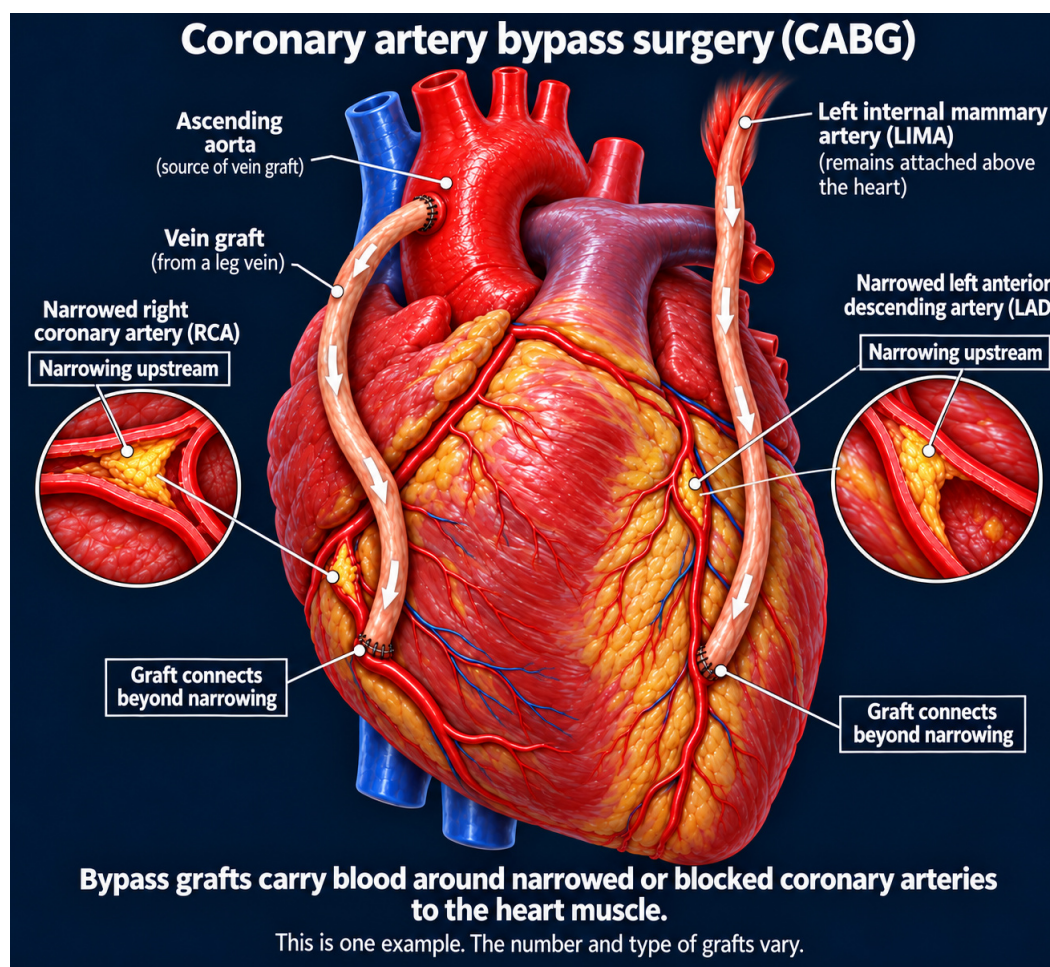
A stent may be needed urgently during a heart attack. For stable CAD, it may help when an important narrowing causes symptoms despite medication. The decision considers your whole clinical picture, rather than a percentage alone.

4. Bypass surgery

Coronary artery bypass grafting, or CABG, creates a new route for blood to reach the heart muscle around a narrowed or blocked artery.

The surgeon uses an artery or vein from elsewhere in the body to build this route.

Bypass surgery may be recommended when the pattern of disease is better treated with surgery - for example, certain complex blockages involving multiple arteries. Your cardiology and surgical teams help determine the best approach.



Each graft connects to the coronary artery beyond its narrowing. Blood travels through the graft to reach heart muscle downstream of the blockage. This is one example; the number and type of grafts vary.

5. Cardiac rehabilitation

After a heart attack, stent, or bypass surgery, eligible patients benefit from cardiac rehabilitation.

This program combines supervised exercise, education, nutrition guidance, and support to help you recover and protect your heart.

Treatment continues after a procedure

A stent or bypass improves blood flow in a specific area. Ongoing medication, healthy habits, and follow-up remain part of your CAD treatment plan.

Coronary artery disease (CAD)

Section 5 of 6: Living with your condition

Understand coronary artery disease, symptoms, testing, treatment, and daily care.

SECTION 5

Living well with coronary artery disease

CAD requires ongoing care, even when you feel well or have had a stent or bypass surgery. Daily habits, medications, and follow-up visits help protect your heart.

Keep taking your medications

Take medications as prescribed. Contact your care team if side effects, cost, or questions make it difficult to follow your plan.

After a stent, antiplatelet medications help prevent a clot from forming inside the stent. Do not stop them without instructions from your prescribing care team, including before dental work or surgery.

Build heart-healthy habits

- Avoid tobacco and ask for help quitting.
- Choose vegetables, fruit, whole grains, beans, fish, and other heart-healthy foods.
- Stay physically active within the plan approved by your care team.
- Work toward your blood pressure, cholesterol, blood sugar, and weight goals.
- Make time for sleep and stress management.

Small, consistent changes are easier to maintain and can make a meaningful difference.

Return to activity with a plan

Ask when you can resume exercise, work, driving, and sexual activity after a heart attack or procedure. If you qualify for cardiac rehabilitation, participate: supervised exercise and education can help you recover and regain confidence.

Pay attention to changing symptoms

Tell your care team if usual activities become harder, chest discomfort becomes more frequent, or you develop new shortness of breath.

For a possible heart attack, call 911. Do not drive yourself, wait for symptoms to become severe, or wait for an office appointment.

Care for your emotional health

Anxiety after a heart diagnosis or procedure is common. Share your concerns with your care team and loved ones. Counseling, support groups, and cardiac rehabilitation can help.

Keep regular follow-up visits to review symptoms, medications, and risk factors.

Coronary artery disease (CAD)

Section 6 of 6: Your next steps

Understand coronary artery disease, symptoms, testing, treatment, and daily care.

SECTION 6

Your next visit and care plan

Your visits help you understand your CAD, review treatment, and develop a plan that fits your daily life.

What should I bring?

- An updated medication list with doses, supplements, and over-the-counter medicines.
- A symptom record: what you were doing, how long symptoms lasted, and what helped.
- Home blood pressure or blood sugar readings, if your team asked you to track them.
- Reports from recent testing or hospital visits outside your usual clinic.
- Your written questions.

Questions about my diagnosis

- Which coronary arteries are affected?
- Is the narrowing limiting blood flow?
- Have I had a heart attack or damage to my heart muscle?
- Is my heart pumping normally?

Questions about treatment

- What does each medication do?
- What are my LDL cholesterol and blood pressure goals?
- Which side effects should I report?
- If I take two antiplatelet medications, how long should I take both?
- Can medications manage my symptoms, or might a stent or bypass help?
- What are the expected benefits and risks of a procedure?

Questions about daily life

- What exercise is appropriate for me?
- Do I qualify for cardiac rehabilitation?
- When can I return to work, driving, sports, and sexual activity?
- What should I do if I develop chest discomfort?
- If nitroglycerin is prescribed, exactly how should I use it?

Leave with a clear plan

Before leaving, make sure you understand:

- Your medications and any changes.
- When to have blood tests or other testing.
- Your activity recommendations and health goals.
- When your next appointment is.
- How to contact your care team for routine questions.

If you suspect a heart attack, call 911. Do not wait for your next appointment.

Sources & further reading

NIH: Understanding coronary heart disease

NIH: CAD symptoms

NIH: Diagnosing CAD

NIH: Heart attack warning signs

ACC CardioSmart: CAD treatment

NIH: CAD treatment

AHA: Coronary stents

NIH: Living with CAD

Updated October 2026. Educational information; your own care plan may differ. Medical illustrations are simplified examples for teaching.