PROCEDURE

Angioplasty and stent placement - heart

A catheter procedure that opens a narrowed heart artery and usually places a stent to keep blood flowing

PURPOSE
Open narrowed coronary arteries and improve heart blood flow

PROCEDURE TYPE
Therapeutic, minimally invasive catheter procedure

WHERE IT IS DONE
Cardiac catheterisation laboratory

ANAESTHESIA
Local anaesthesia with moderate sedation

HOW LONG IT TAKES
About 30 minutes to two hours

PREPARATION
Fasting and medicine adjustments, especially blood thinners

RECOVERY
Same day or overnight; no driving until cleared

MAIN RISKS
Bleeding, artery damage, heart attack, stroke

RESULTS
Blood-flow result known immediately

Overview

Heart angioplasty, also called percutaneous coronary intervention (PCI), opens a narrowed or blocked coronary artery without open surgery. Coronary arteries supply blood and oxygen to the heart muscle.

A cardiologist passes a thin catheter through an artery in your wrist or groin. A small balloon is inflated inside the narrowing, pushing fatty material against the artery wall to improve blood flow.

A mesh tube called a stent is usually left in place. Most coronary stents release medicine that helps prevent new tissue from narrowing the artery again.

Why the procedure is performed

Angioplasty may be performed:

During a heart attack, quickly opening the artery can limit heart muscle damage. For stable coronary artery disease, treatment often aims to reduce angina and improve activity. The likely benefit depends on the artery involved, the severity of the narrowing, and your overall health.

- During some heart attacks
- For new or worsening angina
- For angina that has not improved enough with medicines
- When tests show a narrowing that significantly limits blood flow
- When a previously treated artery has narrowed again

Who should and should not have it

Angioplasty may be appropriate when a coronary narrowing causes a heart attack, significantly limits blood flow, or produces symptoms despite suitable treatment.

It is not best for every narrowing. Some can be managed with medicines and lifestyle changes. Coronary artery bypass grafting may provide a better result for some people with diabetes, several complex narrowings, or disease in an important main artery.

A planned procedure may be delayed or avoided if you have:

Tell the team if you are or may be pregnant because X-rays are used, although urgent treatment may still be necessary.

Your cardiologist should explain why angioplasty is recommended and how it compares with medicines or bypass surgery.

- Active bleeding or cannot safely take antiplatelet medicines
- A serious untreated infection
- A recent major kidney problem requiring assessment before contrast dye
- A previous severe contrast reaction that has not been addressed
- Another uncontrolled condition that makes an elective procedure unsafe

How to prepare

Follow the treating facility's instructions about fasting and medicines.

Ask for specific advice if you have diabetes, use insulin, or take blood thinners like warfarin or apixaban , antiplatelet medicines, or medicines that affect the kidneys.

Do not stop aspirin, clopidogrel, ticagrelor, prasugrel, warfarin, apixaban, rivaroxaban, or similar medicines on your own. Stopping or continuing them at the wrong time can cause harm.

Tell the team about:

Arrange for someone to take you home and bring an overnight bag. Emergency angioplasty requires little preparation because restoring blood flow takes priority.

- All prescribed, over-the-counter, and herbal medicines
- Allergies or previous contrast dye reactions
- Kidney disease, diabetes, or bleeding problems
- Any chance of pregnancy
- Recent illness, fever, or infection

What happens during the procedure

You lie on an X-ray table while staff monitor your heart rhythm, blood pressure, and oxygen. An intravenous line is inserted.

The wrist or groin is cleaned and numbed with local anaesthetic. Sedation may make you relaxed and sleepy, but most people remain awake.

The cardiologist inserts a short tube into the artery and guides a catheter toward the heart. Contrast dye makes the coronary arteries visible on moving X-ray images and may cause brief warmth.

A thin wire is passed across the narrowing. A balloon catheter moves over the wire and is inflated for several seconds. This may cause temporary chest pressure. A stent expands against the artery wall and remains there after the balloon is removed.

The cardiologist checks the result, removes the catheters, and controls bleeding with pressure, a closure device, or a wrist compression band.

Recovery and what to expect afterward

Mild bruising and tenderness at the wrist or groin are common. Tell staff immediately about significant or persistent chest pain.

You can usually eat and drink when the team says it is safe. You may need to rest your wrist or lie flat, depending on the catheter site. Avoid heavy lifting and strenuous activity until the puncture has healed.

Do not drive yourself home. Follow the facility's advice about when you may drive again.

Desk work may be possible within several days after an uncomplicated planned procedure. Manual work may require a longer break. Recovery can take longer after a heart attack or complication.

Take antiplatelet medicines exactly as prescribed to prevent a clot inside the stent. Do not stop them without speaking to your cardiology team, including before dental treatment or surgery.

Risks and possible complications

Risk depends on whether treatment is planned or an emergency, the complexity of the artery disease, and your other conditions.

Possible complications include:

A stent clot can cause a heart attack, so prescribed antiplatelet medicines are essential. Your cardiologist should discuss your individual risks before consent unless immediate emergency treatment is needed.

- Bleeding, bruising, or artery damage at the wrist or groin
- Contrast dye allergy or kidney injury
- Abnormal heart rhythms
- Coronary artery damage or sudden blockage
- Heart attack or stroke
- Emergency bypass surgery
- Death
- A blood clot inside the stent
- The treated area narrowing again

Results and follow up

The cardiologist can usually tell immediately whether blood flow has improved.

Angioplasty treats a specific narrowing but does not cure coronary artery disease. Follow-up may include medicines for cholesterol, blood pressure, angina, or clot prevention, plus cardiac rehabilitation and support with activity, diet, and stopping smoking.

Attend appointments even if you feel well. The team will review symptoms, the puncture site, medicines, and recovery. Repeat angiograms are not routinely needed for everyone; further testing depends on your condition and symptoms.

Alternatives

Alternatives depend on the urgency and pattern of coronary artery disease.

Medicines and lifestyle treatment can control angina and reduce future cardiovascular risk but do not mechanically open an artery.

Coronary artery bypass grafting , or CABG, creates new routes around blocked arteries. It may be preferred for several important narrowings or complex disease. It requires a larger operation and longer recovery but may be more durable for some people.

No immediate procedure, with further testing , may be reasonable when it is unclear whether a narrowing limits blood flow.

During some heart attacks, clot-dissolving medicine may be used when timely angioplasty is unavailable. It is less reliable at opening the artery and can cause bleeding.

Delaying or declining treatment for a heart attack can allow more heart muscle damage. Ask what each option is expected to achieve for you.

When to call your healthcare team

Call emergency services now if you develop:

Do not drive yourself in an emergency.

Contact your healthcare team promptly for increasing redness, warmth, drainage, swelling, or pain at the puncture site; fever; unusual bleeding; or a hand or foot that becomes cool, pale, numb, or weak.

- Severe or persistent chest pressure or pain, especially if similar to previous heart-attack symptoms
- Severe shortness of breath, fainting, or sudden sweating with chest discomfort
- Face drooping, arm weakness, speech difficulty, or other stroke signs

- Bleeding from the wrist or groin that does not stop with firm pressure
- Rapidly increasing swelling at the catheter site

Common questions

Will I be asleep?

Usually not. Local anaesthetic numbs the area, and sedation may make you sleepy. General anaesthesia is uncommon.

Can I drive home?

No. Arrange for another adult to take you home and follow instructions about when to drive again.

How painful is it?

The numbing injection may sting. You may feel pressure at the access site or temporary chest discomfort when the balloon is inflated. Report any pain.

When will I know if it worked?

The cardiologist can usually see the result immediately and will explain what was treated.

Does the stent ever come out?

No. It remains permanently while tissue grows around it.

Will I still need heart medicines?

Usually. A stent does not cure coronary artery disease. Antiplatelet treatment is particularly important, and other heart-protective medicines may be needed.

Sources

- National Heart, Lung, and Blood Institute - Percutaneous Coronary Intervention
- NHS - Coronary angioplasty and stent insertion
- MedlinePlus Medical Encyclopedia - Angioplasty and stent placement: heart
- American Heart Association - What Is a Coronary Angioplasty and Stent?
- American College of Cardiology, American Heart Association, and Society for Cardiovascular Angiography and Interventions - 2021 Guideline for Coronary Artery Revascularization



- British Heart Foundation - Coronary angioplasty and stents