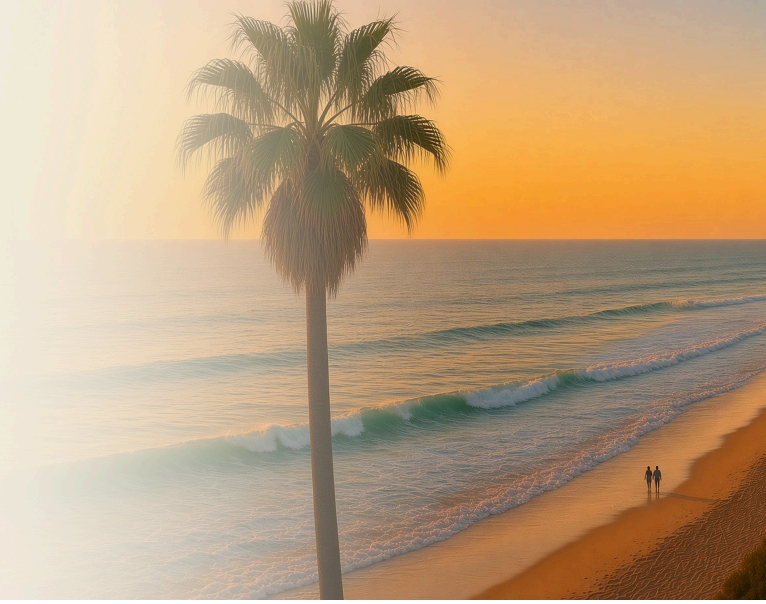
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Choosing a Heart Test

Stress echo, nuclear testing or a CT of the heart arteries. How your cardiologist picks the test that fits you.

No radiation
with a stress echo, which takes 30 to 45 minutes

2–4 hrs
for a nuclear stress test, with rest and stress pictures

12–24 hrs
without caffeine before a vasodilator stress test, at most labs

THREE TESTS

What each test looks at

Stress echo
Ultrasound pictures before and right after a treadmill walk, or with dobutamine if you can't walk. Muscle fed by a narrowed artery doesn't squeeze normally under stress. It uses no radiation.

Nuclear stress test
A radioactive tracer given at rest and at peak stress shows blood flow to the muscle. Typically 5 to 12 millisieverts of radiation, compared with about 3 a year from background.

Coronary CT angiography
A CT scan with iodinated contrast shows the arteries themselves, using 3 to 8 millisieverts. A beta-blocker slows your heart for sharper pictures. A normal scan effectively closes the door on coronary disease as the cause.

HOW THE CHOICE GETS MADE

Matching the test to your odds

Your odds of a blocked artery
from age, sex, symptoms and risk factors

- **Under 5%** — Usually no test needed
- **5 to 50%** — CCTA is often the right first test
- **Over 50%** — A functional test, or straight to a catheter test → **Can you walk on a treadmill?**
  - yes → **Yes, exercise** — Stress echo or nuclear with the treadmill
  - no → **No, medicine stress** — Nuclear uses a vasodilator (regadenoson, adenosine or dipyridamole). Stress echo uses dobutamine.

Already have stents or bypass?
A functional test is usually preferred, sometimes straight to a catheter test.

Stress echo or nuclear?
Stress echo if ultrasound pictures are clear. Nuclear with obesity or lung disease.

Ask why

The cutoffs are guidelines, and your situation, your preference and the local lab all factor in. If you're unclear why a particular test was chosen, ask. The reasoning should make sense given your symptoms and risk factors.

GETTING READY AND READING RESULTS ARE ON THE BACK

BEFORE AND AFTER YOUR TEST

Getting ready and reading results

GETTING READY

Caffeine	Caffeine blocks the vasodilator drugs (regadenoson, adenosine, dipyridamole), so most labs require 12 to 24 hours without it before that kind of test. For exercise testing without a vasodilator the rules are looser, but most labs prefer no heavy caffeine the morning of the test.
How long	Stress echo takes 30 to 45 minutes. Nuclear takes 2 to 4 hours, because the rest and stress pictures are separated by time for the tracer. CCTA takes 30 to 45 minutes, including preparation and breath-hold practice.
Special cases	With kidney disease, stress echo or nuclear is preferred, since CCTA contrast is risky for weak kidneys. AFib blurs CCTA, so a functional test is the better choice. In pregnancy, stress echo is the test of choice, since CCTA and nuclear use radiation.

YOUR CCTA REPORT (CAD-RADS GRADE)

0	1	2	3	4A	4B	5
No plaque	Minimal	Mild	Moderate	Severe	Severe, wider	Total occlusion
0%	1–24%	25–49%	50–69%	70–99% in 1 or 2 arteries	left main 50%+ or all 3 at 70%+	fully blocked

The percent is how narrow the worst spot is. The report also lists plaque type and high-risk plaque features, because these predict future events apart from how narrow the artery is.

STRESS ECHO AND NUCLEAR REPORTS

Stress echo	Normal means the walls moved normally at rest and stayed normal at peak stress. A positive test shows new wall motion problems under stress, often naming the artery territory.
Nuclear	A reversible defect, normal at rest and abnormal at stress, means poor blood flow under stress. A fixed defect, abnormal at both, usually means scar from a prior heart attack, though breast tissue or the diaphragm can cause the same look.
A positive result	It flags the need for further evaluation. The next step might be better medicines, a repeat test in 6 to 12 months, a different test or a catheter angiogram.

WHEN TO GET HELP

Call 911	Severe chest pain at rest, especially with shortness of breath, sweating, nausea or pain spreading to the arm or jaw. Don't wait for a scheduled stress test.
Same day	Call your cardiologist for new chest pain at rest or with mild exertion, palpitations with chest pressure, or any symptom that feels different from your baseline.
Within 1 to 2 weeks	Schedule a clinic visit for stable, predictable chest pain on exertion that you've been managing on your own.

NORMAL TEST, STILL HAVING SYMPTOMS?

Normal tests don't rule out every cause of chest pain. Microvascular disease, vasospasm, stomach and muscle causes, and anxiety can all mimic angina. If symptoms persist, ask about other tests, such as PET with quantitative flow reserve.

READ THE FULL ARTICLE

damianrasch.com/
stress-imaging-decision-tree

For education only, and not a substitute for advice from your own physician. Sources include the 2021 AHA/ACC chest pain guideline, the PROMISE and SCOT-HEART trials, the CAD-RADS reporting system (2016, 2022), the 2020 ASE stress echocardiography guideline and the 2016 ASNC SPECT imaging guideline.

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