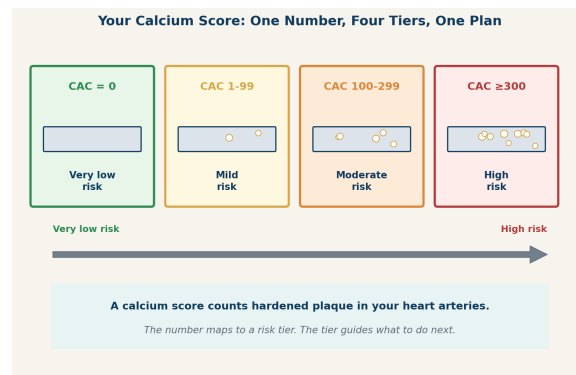


# Coronary Calcium Score

The CAC test: one number that helps decide if you need a statin

**A 5-minute scan, no IV, no contrast - the score guides the plan.**



**Online:** <https://go.riasalimd.com/cac-guide>

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## Names & Terms You Will Hear

| Term                                | Meaning                                                                                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coronary artery calcium (CAC) score | A number from a special heart CT scan that counts hardened plaque in the heart's arteries. The number maps to a risk tier.                                                                |
| Agatston score                      | The most common way the calcium is counted on the scan. Named for Dr. Arthur Agatston, who described the method in 1990.                                                                  |
| Heart scan / calcium scan           | Patient names for the same test - a non-contrast cardiac CT used to count calcium.                                                                                                        |
| Non-contrast cardiac CT             | A CT scan of the heart that does not use IV dye. The scan most often used to measure the calcium score.                                                                                   |
| ASCVD risk                          | Atherosclerotic Cardiovascular Disease risk - your chance of a heart attack or stroke in the next 10 years. Calculated from age, sex, blood pressure, cholesterol, smoking, and diabetes. |
| Pooled cohort equation (PCE)        | The standard calculator that turns those risk factors into a 10-year ASCVD risk estimate. CAC is most useful in the 'in-between' results.                                                 |
| Statin                              | A cholesterol-lowering medicine - the most common reason a CAC score is checked. The score helps decide whether the benefit is large enough to start one.                                 |
| MESA                                | The Multi-Ethnic Study of Atherosclerosis - a long-running US study that produced most of the data behind CAC tiers.                                                                      |
| CAC = 0 ('the warranty period')     | A calcium score of zero usually means the chance of a heart-attack or stroke in the next 5-10 years is very low. Lifestyle still matters.                                                 |
| Soft plaque                         | Buildup in an artery that is not yet calcified. CAC does not see it - only hardened (calcified) plaque shows up.                                                                          |



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**This test is for prevention, not for symptoms.** If you have new or worsening chest pain, pressure, shortness of breath, or fainting, do not wait for a CAC scan. Call us the same day, or call 911 if symptoms are severe. Symptoms need a different test - usually a stress test or a CT angiogram.



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## Coronary Calcium Score?

- A calcium score (CAC) is a number from a quick heart CT scan that counts hardened plaque in your heart arteries.
- Hardened plaque is plaque that has been there long enough to start absorbing calcium from your blood - calcium shows up bright white on the scan.
- The scan takes about 5 minutes. No IV, no contrast dye, no fasting, and you can drive yourself home afterward.
- The radiation dose is low - about the same as a mammogram or a year of natural background radiation in some parts of the US.
- A radiologist counts the calcium and turns it into a single Agatston score. The score maps to a risk tier.
- The four risk tiers are: 0 (very low), 1 to 99 (mild), 100 to 299 (moderate), and 300 or higher (high). The higher the score, the higher the risk of a future heart event.
- CAC is NOT a test for chest-pain symptoms or for an emergency. For those, a stress test or a CT coronary angiogram (CTA) is used.

### Risk of a Heart Attack or Cardiac Death in the Next 10 Years



*Numbers from the MESA study (a long-term US heart-disease study). Your own risk also depends on age, blood pressure, cholesterol, diabetes, and smoking.*

*What each risk tier means in plain terms - your 10-year chance of a heart attack or cardiac death. Numbers are typical patterns from MESA; your own risk also depends on age, blood pressure, cholesterol, diabetes, and smoking.*

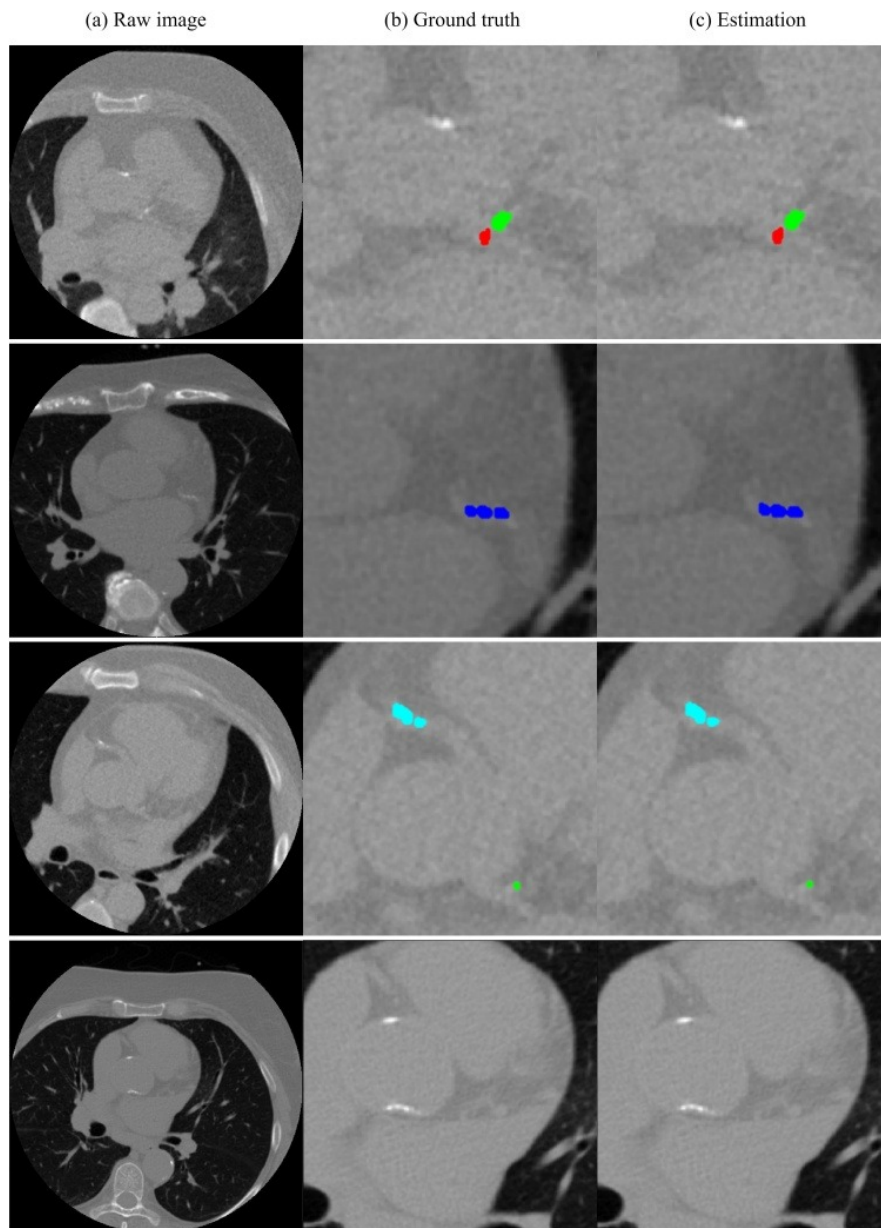


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A real non-contrast cardiac CT scan, the same kind a calcium-score report uses. Left column: raw cardiac CT slices. Middle and right columns: software has marked the calcium and color-coded which heart artery it sits on (LAD = red, LCx = green, RCA = blue, LM = cyan). The bottom row shows a clean slice with no calcium. Image: Zhang et al., Eur J Radiol via PMC (CC BY 4.0).



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## How the Agatston Score Is Calculated

- The scanner takes thin slices of the heart while you hold your breath.
- A computer marks each spot where calcium is bright on the slice.
- Each spot gets a number based on how bright it is and how big it is.
- The numbers from all the spots are added up to give the Agatston score - one number for the whole heart.
- The same software can also break the score down by artery (LAD, LCx, RCA) - but the tier-and-plan decision uses the total.
- A score is reported in 'Agatston units.' A score of 100 in one report means the same thing as 100 in another - this is one of the test's strengths.



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## Why It Matters

- Heart disease is the leading cause of death in the United States. Most of it starts silently, years before any symptom.
- The standard risk calculator uses your age, blood pressure, cholesterol, smoking, and diabetes - but two patients with the same numbers can have very different artery health.
- A calcium score looks inside the artery wall itself. It shows what years of risk factors have actually done to your arteries.
- The score is most useful when the decision about a statin is uncertain - when your calculator number falls in the 5% to 20% range.
- A score of 0 means hardened plaque is absent - the chance of a heart attack in the next 5-10 years is very low, and some patients can hold off on a statin.
- A higher score is a clear signal to start lifestyle changes plus a statin sooner rather than later.
- The score is a tiebreaker, not the only voice. Family history, lipoprotein(a), other risk markers, and your own preferences are all part of the decision.

### Who Benefits Most from a Calcium Score



**Most useful when 'should I start a statin?' is on the table.**

*The most common path to a CAC test - middle-aged adult with an in-between risk number and a statin decision that is not clear cut. Your situation may differ; talk to your clinician.*



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## When CAC Is Most Useful - the Gray Zone

- Patient A: 10-year ASCVD risk of 2% (very low) - a statin is usually not needed. CAC adds little here.
- Patient B: 10-year ASCVD risk of 25% (very high) - a statin is usually recommended. CAC adds little here either.
- Patient C: 10-year ASCVD risk of 9% (the gray zone) - this is where CAC helps most.
- A CAC of 0 in Patient C may move them away from a statin, with closer lifestyle follow-up.
- A CAC of 150 in Patient C is a clear push toward a statin and tighter risk control.
- Most of the value of CAC is in this borderline / intermediate-risk group - which is why the 2018 cholesterol guideline focuses there.

**The score is a tiebreaker, not the only voice.** Family history of early heart disease, lipoprotein(a), diabetes, chronic kidney disease, inflammatory conditions, preeclampsia history, and your own preferences are part of the decision. Bring all of them to the conversation.



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## Risk Factors

Some patients are more likely to develop this condition. Knowing your risk helps your care team take extra precautions.

| Risk Factor                                    | Why It Increases Risk                                                                                                                                                                  |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Age 40-75 with borderline or intermediate risk | This is the group the 2018 cholesterol guideline recommends for CAC testing - young enough to act on the result, old enough for calcium to be a useful signal.                         |
| Family history of early heart disease          | A parent or sibling with a heart attack or heart stent before age 55 (men) or 65 (women) is a strong reason to check the score sooner.                                                 |
| Borderline LDL cholesterol (70-189 mg/dL)      | When the LDL number alone does not settle the statin decision, the calcium score often does.                                                                                           |
| Hesitant about a lifelong statin               | If you and your doctor are leaning toward 'maybe,' the score gives you a tiebreaker. A score of 0 may delay the start; a higher score moves it forward.                                |
| Diabetes or pre-diabetes                       | Diabetes speeds up artery disease. A CAC score helps decide how aggressive lipid and blood-pressure treatment should be.                                                               |
| Strong personal risk factors                   | High lipoprotein(a), chronic kidney disease, inflammatory conditions like rheumatoid arthritis or lupus, or a history of preeclampsia - these all push CAC testing higher on the list. |
| Smoker or recent quitter                       | Smoking is one of the strongest accelerators of artery disease. A score helps show what the damage looks like now.                                                                     |



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## CAC Score - Tier, Risk, and Typical Action

| Score (Agatston) | Risk tier | Typical 10-year event risk        | Typical next step                                                         |
|------------------|-----------|-----------------------------------|---------------------------------------------------------------------------|
| 0                | Very low  | About 1% over 10 years            | Lifestyle. Repeat in 5-10 years if risk factors change.                   |
| 1-99             | Mild      | About 3% over 10 years            | Lifestyle plus a moderate-intensity statin in many patients.              |
| 100-299          | Moderate  | About 7% over 10 years            | Moderate to high-intensity statin. Tight BP and diabetes control.         |
| 300 or higher    | High      | About 12% or higher over 10 years | High-intensity statin. Aggressive BP, lifestyle, and risk-factor control. |

## Your Score, Your Plan - the Four Risk Tiers at a Glance

| CAC = 0                                                                                                                                                                                                                 | CAC 1-99                                                                                                                                                                                                                   | CAC 100-299                                                                                                                                                                                                              | CAC 300 or higher                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Very low 10-year risk</li> <li>• Lifestyle is the main treatment</li> <li>• Many patients can hold off on a statin</li> <li>• Recheck in 5-10 years if risks change</li> </ul> | <ul style="list-style-type: none"> <li>• Mild calcified plaque present</li> <li>• Moderate-intensity statin in many patients</li> <li>• Tighter BP and cholesterol targets</li> <li>• Lifestyle still essential</li> </ul> | <ul style="list-style-type: none"> <li>• Moderate plaque burden</li> <li>• Moderate to high-intensity statin</li> <li>• Treat BP, diabetes, weight tightly</li> <li>• Aspirin only after a bleeding-risk talk</li> </ul> | <ul style="list-style-type: none"> <li>• High long-term risk</li> <li>• High-intensity statin</li> <li>• BP target around 130/80</li> <li>• Aggressive lifestyle + close follow-up</li> </ul> |



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## Treatment Options

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- The score itself is not a treatment - it is a guide to what comes next.
- For a score of 0, the next step is usually lifestyle (food, movement, sleep, no tobacco) and a repeat score in 5-10 years.
- For a score of 1-99, lifestyle plus a moderate-intensity statin is often recommended, especially with other risk factors.
- For a score of 100-299, a moderate-to-high intensity statin is recommended, plus tight control of blood pressure, diabetes, and weight.
- For a score of 300 or higher, treat as high risk - high-intensity statin, blood-pressure target around 130/80, aggressive lifestyle, and consider aspirin only after a careful bleeding-risk talk.
- The score does NOT tell you to get a stent or a stress test. Those are decided based on symptoms.
- If you have chest pain, breathlessness, or other symptoms, see your doctor first - those are handled with a different test, not a CAC.

### Three Different Heart Tests - What Each One Tells You

#### Calcium Score (CAC)

**What it shows:**  
Hardened (calcified) plaque  
in the heart arteries

**When it helps:**  
Adults 40-75 deciding  
about a statin

#### Stress Test

**What it shows:**  
How the heart muscle  
responds to exertion

**When it helps:**  
When you have symptoms  
like chest pain or breathlessness

#### CT Angiogram (CTA)

**What it shows:**  
The inside of the arteries -  
both hard AND soft plaque

**When it helps:**  
Symptoms + when more  
detail is needed

*CAC, stress test, and CT coronary angiogram each answer a different question. CAC is a prevention tool. Stress test and CTA are used when you have symptoms or a different kind of concern.*



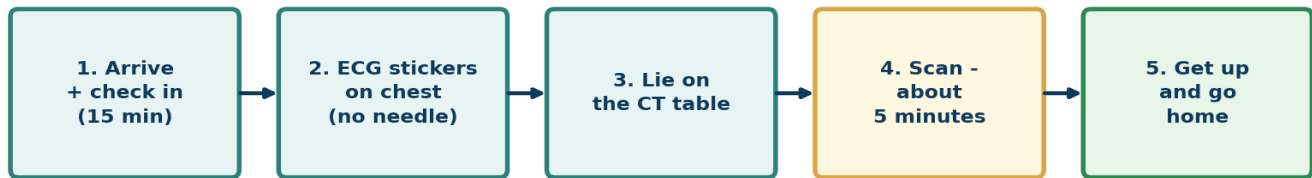
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## Scan Day: What to Expect



**No IV, no contrast dye, no fasting. Total visit is usually under 30 minutes.**

*A real visit is usually under 30 minutes door-to-door. The scan itself is about 5 minutes; the longest part is checking in and getting ECG stickers on.*



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## CAC vs Stress Test vs CT Angiogram - Which Question Each Answers

| Test                                     | What it shows                                                    | When it helps                                                       | Radiation / IV                         |
|------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------|
| Calcium Score (CAC)                      | Hardened plaque in the heart arteries (a single number)          | Adults 40-75 deciding on a statin; no symptoms                      | Low (~1 mSv) / No IV                   |
| Stress test (treadmill or pharmacologic) | How the heart muscle responds to exertion                        | Chest pain or shortness of breath - is the artery flow-limiting?    | Varies / Usually IV                    |
| CT Coronary Angiogram (CTA)              | Inside of the arteries - hard AND soft plaque, percent narrowing | Symptoms plus need for more detail; rule-out of significant disease | Moderate (~5-10 mSv) / IV contrast     |
| Coronary catheter angiogram              | Direct, real-time view of the arteries through a thin tube       | When a procedure (stent) is likely or confirmed                     | Higher / IV contrast + arterial access |



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## What the Scan Visit Looks Like - Step by Step

- You arrive at the imaging center - usually a hospital or outpatient radiology center.
- You may be asked to change into a gown so there are no metal zippers or buttons in the scan zone.
- The tech places three or four sticky pads (ECG leads) on your chest to time the scan to your heartbeat.
- You lie on your back on the CT table. The table slides into a short, open ring scanner - much shorter than an MRI tunnel.
- The tech asks you to hold your breath for about 5 to 15 seconds while the scanner runs. You may need to do this twice.
- That's it. You get up, get changed, and head home. No recovery, no driver needed.
- Most patients get the result within a few days. We will go over the number and the next step with you.



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## When NOT to Get a CAC Scan

- You have new or worsening chest pain, shortness of breath, or fainting - those need a different test (stress test or CT angiogram), often the same day.
- You are under 40 and have no major risk factors - the score is usually 0, and the radiation dose is not worth it.
- You are already on a statin - the score after starting treatment is less informative.
- You have known heart disease, a prior stent, or a prior heart attack - your prevention plan is already aggressive; CAC adds little.
- Your risk calculator number is very low (under 5%) or very high (over 20%) - the score rarely changes the decision in those groups.
- Pregnancy - radiation is not appropriate during pregnancy. Wait until after.

## Prevention Is Bigger Than a Score - Where to Read Next

- A calcium score is one tool. Heart-disease prevention is a system - what you eat, how you move, what you take, and how often you check in.
- What blocked-artery disease actually is: see the [Coronary Artery Disease guide](#).
- Chest pain that comes with effort but is not a heart attack: see the [Stable Angina guide](#).
- What a heart attack is and what to do when one happens: see the [Heart Attack guide](#).
- The eating pattern with the strongest heart-attack-prevention evidence: see the [Heart-Healthy Eating guide](#).
- How blood pressure fits in: see the [Hypertension guide](#).
- A test that gives more anatomic detail when symptoms are present: see the [Coronary CTA guide](#).
- Statin muscle aches and what to do about them: see the [Statin-Associated Muscle Symptoms guide](#).

**A score of 0 is reassuring, not a free pass.** The chance of a heart attack in the next 5-10 years is very low - what some call the 'warranty period.' But lifestyle, blood pressure, blood sugar, and stopping tobacco still matter. The warranty runs out faster when those slide.



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## Comfort Measures at Home (No Medication Needed)

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These simple steps support healing and ease symptoms. Use them alongside any medication your doctor prescribes.

- Eat in a heart-healthy pattern - Mediterranean or DASH-style, more plants, less ultra-processed food, less added sugar and salt.
- Move every day - 150 minutes a week of brisk walking or its equivalent is the floor, not the ceiling. Strength training twice a week adds even more benefit.
- Keep blood pressure under 130/80, with a home cuff if needed. High blood pressure is the most common driver of artery damage.
- Stop tobacco and vaping. Nicotine in any form injures the artery wall and raises clotting risk.
- Sleep 7-9 hours, treat sleep apnea if present. Poor sleep raises blood pressure and inflammation.
- Manage stress - a daily 10-minute walk, breathing practice, social time, or therapy. Chronic stress raises blood pressure and harms the arteries.
- Keep weight in a healthy range; even a 5-10% drop helps blood pressure, cholesterol, and blood sugar.



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## Risks, Benefits, and Alternatives

Every choice has trade-offs. Use this table to start the shared decision conversation.

| Option                            | Risks                                                                                                                                                    | Benefits                                                                                                                                                | Alternatives                                                                                                             |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Get a calcium score               | Small radiation dose (about a mammogram). Usually \$50-\$200 out of pocket - insurance often does not cover it. Cannot find soft (non-calcified) plaque. | A clear, objective number that helps decide on a statin and other prevention steps. Improves the accuracy of risk prediction over the calculator alone. | Skip the scan and decide based on the risk calculator and shared decision-making. Use other markers like lipoprotein(a). |
| Start a statin even with CAC = 0  | Side effects of statin therapy (muscle aches, rare liver or muscle issues). Lifelong commitment.                                                         | Removes any uncertainty. May still be the right choice if family history is strong, lipoprotein(a) is high, or LDL is very high.                        | Hold off on the statin and double down on lifestyle. Recheck CAC in 5-10 years.                                          |
| Aggressive treatment for CAC 300+ | Higher-dose statin side effects. Blood-pressure medicines may cause dizziness or kidney effects. Bleeding risk if aspirin is added.                      | Cuts the risk of a heart attack or stroke. The higher the score, the larger the benefit.                                                                | Moderate-intensity statin only, or single-step blood-pressure control, with closer follow-up.                            |
| Repeat the CAC scan in 5 years    | Extra radiation and another out-of-pocket cost. The score rarely goes down.                                                                              | Tracks progression. A fast-rising score may justify intensifying treatment. A stable score may reassure.                                                | Skip the repeat - use yearly risk-factor checks and lipid panels instead.                                                |



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| Option                                    | Risks                                                                        | Benefits                                                                                      | Alternatives                                                                                         |
|-------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Get a CTA (coronary CT angiogram) instead | Higher radiation, IV dye (with rare allergic or kidney issues), higher cost. | Shows hard AND soft plaque, plus the inside of each artery. Useful when symptoms are present. | Stick with CAC when the question is prevention. Choose CTA when symptoms or higher pre-test concern. |



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## Common Misconceptions

| Myth                                                                              | Reality                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A calcium score of zero means I have no heart disease.                            | It means hardened plaque is absent. Soft plaque can still be present - the score is a strong reassurance, not a guarantee. Risk-factor control still matters.                                                        |
| If my score is high, I need a stent.                                              | Not necessarily. Stents are for blocked arteries causing symptoms. A high CAC means higher long-term risk - it does not tell us if any artery is critically narrowed right now.                                      |
| Statins make calcium scores worse, so my score is rising because of the medicine. | Statins can move soft plaque toward calcified plaque, which can make calcium look like it is going up - but the underlying risk goes DOWN. The score after starting a statin is less informative than the first one. |
| I am too young or too healthy for a CAC.                                          | The most useful age range is 40-75. Younger may be reasonable if there is a strong family history. Talk to your clinician before deciding.                                                                           |
| The calcium scan uses contrast dye and an IV.                                     | It does not. CAC is a non-contrast scan - no IV, no dye, no fasting needed.                                                                                                                                          |
| Insurance covers a CAC scan for everyone.                                         | Coverage varies and is often limited. Most patients pay \$50-\$200 out of pocket. Ask the imaging center for the cash price up front.                                                                                |
| A calcium score is a one-time test.                                               | Most patients do not repeat it within 5 years. Some patients with rising risk repeat at 5-10 years. The score rarely goes down.                                                                                      |
| If I feel fine, I don't need a calcium score.                                     | Heart disease often has no symptoms until the first event. The score's job is to find the silent risk before that event.                                                                                             |



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## Possible Complications

Knowing what can go wrong helps you spot problems early. Most complications are uncommon, especially with treatment.

| Where / What                        | What Can Happen                                                                                                                                                                                    |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| False reassurance from a score of 0 | A score of zero is reassuring but does not rule out soft plaque or future risk - especially in smokers, young people, and those with a strong family history. Lifestyle still matters.             |
| Anxiety from a high score           | A high score can be upsetting. It is a signal to act, not a diagnosis of imminent harm. The action plan - statin, blood-pressure control, lifestyle - usually lowers long-term risk substantially. |
| Radiation exposure                  | A small dose of radiation, usually around 1 mSv - similar to a mammogram and lower than a CT angiogram. Cumulative dose is rarely a concern for a single CAC scan.                                 |
| Incidental findings on the scan     | Sometimes the scan picks up a lung nodule, an enlarged thyroid, or other unexpected findings. The radiologist will report these; most are not serious but may need follow-up.                      |
| Cost (financial complication)       | Most patients pay out of pocket (\$50-\$200). For patients with limited income, the cost itself can be a barrier - we will help find the most affordable option.                                   |
| Decision paralysis                  | A score in the gray zone (for example, 50 in a 60-year-old) can be hard to interpret without a clinician. Always pair the score with a follow-up visit.                                            |



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## Common Questions Patients Ask About CAC Testing

| Question                          | Quick answer                                                                                                         |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Do I need to fast?                | No fasting required for a CAC scan.                                                                                  |
| Will I get an IV or contrast dye? | No. CAC is non-contrast - no IV, no dye, no kidney concerns.                                                         |
| How long is the visit?            | Usually under 30 minutes. The scan itself is about 5 minutes.                                                        |
| What does it cost?                | Usually \$50-\$200 cash. Most insurance does not cover it for screening - ask the imaging center for the cash price. |
| What if I am claustrophobic?      | The CT scanner is a short, open ring - very different from an MRI tunnel. Most patients tolerate it well.            |
| Can I drive home?                 | Yes. No sedation, no recovery needed - you can drive yourself.                                                       |
| When will I get the result?       | Usually within a few days. We will review it with you and explain next steps.                                        |



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## Points to Know

If you remember nothing else, remember these key points.

- A calcium score (CAC) counts hardened plaque in your heart arteries. The number maps to a risk tier: 0, 1-99, 100-299, 300 or higher.
- The test is a quick non-contrast cardiac CT. No IV, no dye, about 5 minutes on the scanner.
- The radiation dose is low - about the same as a mammogram.
- The score is most useful for adults 40-75 deciding whether to start a statin.
- A score of 0 is reassuring - lifestyle plus a recheck in 5-10 years for most patients.
- A score of 300 or higher is a high-risk signal - high-intensity statin, tight blood pressure, and aggressive lifestyle.
- CAC is not for chest pain - that needs a stress test or a CT angiogram instead.
- Cost is usually \$50-\$200 cash; insurance often does not cover it. Worth it for many patients in the gray zone.



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## When to Call Us - and When to Call 911

If you are not sure, call. We would rather hear from you twice than miss a real problem.

- Call us before scheduling a CAC if you are unsure whether the test is right for you.
- Call us after your scan to discuss the result - the report gives a number, not a plan.
- Call us if you have chest pain, shortness of breath, or other symptoms while waiting for the scan - those are NOT what CAC is for, and you may need a different test or to be seen the same day.
- Call 911 right away for sudden chest pressure, severe shortness of breath, fainting, or stroke-like symptoms (face droop, arm weakness, slurred speech). Do not drive yourself.
- Call us if you are already on a statin and want to know whether a calcium score still makes sense - usually it adds less value once treatment has started.
- Call us if you have a strong family history of early heart disease in a parent or sibling - we will often check a CAC earlier.
- Call us with questions about cost, where to schedule the scan, and what your insurance covers - we can help.

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## Trusted Resources

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The links below are the trusted resources Dr. Ali used to write this guide and that he recommends you visit for more information. Each is a clickable link in the digital version and a Short.io tracked URL on the printed version.

- [American Heart Association - Coronary Artery Calcium \(CAC\) Test](#) - Plain-language AHA explanation of what the test is and how the result is used.
- [Cleveland Clinic - Coronary Calcium Scan](#) - Patient-friendly overview of what to expect on scan day and how the score is read.
- [Mayo Clinic - Heart Scan \(Coronary Calcium Scan\)](#) - Mayo's overview of the heart scan, who benefits, and how it guides treatment.
- [MedlinePlus - Coronary Calcium Scan](#) - US National Library of Medicine consumer overview of the test and result interpretation.
- [MESA - 10-Year Risk Calculator with CAC](#) - Free online calculator from the NHLBI MESA study - enter your CAC score plus a few risk factors to see your refined 10-year risk estimate.



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## Sources Used to Build This Guide

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Every recommendation in this guide is grounded in one or more of the studies, guidelines, or trusted resources below. Short links are tracked so Dr. Ali can see which references patients are reading; nothing personally identifying is captured.

- [2018 AHA/ACC Multisociety Guideline on the Management of Blood Cholesterol \(Grundy et al., Circulation 2019; PMID 30586774\) \[Guideline\]](#)  
Primary US guideline recommending CAC scoring as a decision aid in adults 40-75 at borderline (5-7.5%) or intermediate (7.5-20%) 10-year ASCVD risk when statin therapy is uncertain. Defines the Agatston score cut-points used in this guide (0, 1-99, 100-299, ≥300).
- [2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease \(Arnett et al., Circulation 2019; PMID 30879355\) \[Guideline\]](#)  
Anchors CAC in the broader primary-prevention framework: pooled-cohort risk estimator first, CAC as a risk modifier when treatment decisions are uncertain, and lifestyle-plus-statin framework.
- [Quantification of coronary artery calcium using ultrafast computed tomography \(Agatston et al., J Am Coll Cardiol 1990; PMID 2407762\) \[Clinical Study\]](#)  
Original Agatston paper defining how the calcium score is calculated from non-contrast cardiac CT - the foundation of every CAC report.
- [Multi-Ethnic Study of Atherosclerosis \(MESA\) - Coronary Calcium and Risk of Cardiovascular Events \(Detrano et al., NEJM 2008; PMID 18367736\) \[Clinical Study\]](#)  
Landmark MESA paper showing each doubling of the Agatston score raises coronary heart-disease event risk across racial and ethnic groups. The evidence base for using CAC as a risk-stratifier.
- [Coronary Calcium Score of Zero and Long-Term Prognosis - MESA Study \(Blaha et al., JACC 2016; PMID 27033596\) \[Clinical Study\]](#)  
Evidence base for the CAC = 0 'warranty period' - patients with a CAC score of zero have a very low 10-year event rate, supporting de-intensification of statin therapy in selected patients.
- [MESA Risk Score Calculator with CAC \(McClelland et al., JACC 2015; PMID 25819173\) \[Clinical Study\]](#)  
The MESA calculator adds CAC to traditional risk factors and improves discrimination over the pooled-cohort equation alone - directly supports using CAC as a decision aid.
- [Cleveland Clinic - Coronary Calcium Scan \[Patient Education\]](#)  
Patient-voice explanation of what a CAC scan is, what to expect, and how results guide treatment. Re-verified statistics against PubMed sources.
- [Mayo Clinic - Heart Scan \(Coronary Calcium Scan\) \[Patient Education\]](#)  
Patient-voice overview of the heart scan, who benefits, and what the score means. Plain-language framing of the test's role in decision-making.
- [American Heart Association - Coronary Artery Calcium Test \[Patient Education\]](#)  
Plain-language AHA explanation for patients of when a CAC test is helpful and how results are used in shared decision-making with a clinician.
- [MedlinePlus - Coronary Calcium Scan \[Patient Education\]](#)  
US National Library of Medicine consumer overview - test purpose, what to expect, and result interpretation in lay terms.



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- [Deep-Learning-Based Coronary Artery Calcium Detection from CT Image \(Lee et al., Sensors 2021: PMC8588163\)](#) [Image Source]  
Source of the CC-BY 4.0 cardiac-CT calcium image used in this guide. Article demonstrates per-vessel CAC quantification on non-contrast cardiac CT - the same kind of image a patient sees on their own report.
- [USPSTF - Risk Assessment for Cardiovascular Disease With Nontraditional Risk Factors \(2018\)](#) [Guideline]  
USPSTF position that evidence is insufficient for routine CAC screening of all asymptomatic adults - frames CAC as a selective decision aid, not a population screening test.



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## About This Guide

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**Version:** 2026-08-15

**Reviewer note:** Reviewed against the AHA Coronary Artery Calcium (CAC) page, the Cleveland Clinic Coronary Calcium Scan page, and Mayo Clinic's Heart Scan overview. Ours adds: a 4-tier risk-card layout with tier-specific 10-year event numbers from MESA, a clear flowchart for who benefits, a 3-panel comparison of CAC vs stress test vs CTA, a 'scan day - what to expect' panel, an RBA table that names the radiation dose and out-of-pocket cost honestly, and explicit cross-links to the CAD, Stable Angina, Heart-Healthy Eating, and Statin Therapy guides.

## Disclaimer

This guide is for educational purposes only and does not replace medical advice from your physician. Recommendations may not apply to every patient. Always follow the specific instructions of Dr. Ali and your care team. In an emergency call 911 or go to the nearest emergency department.



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