Office-Based Cardiac CT.

A new model for preventive heart care — bringing anatomy, physiology, and plaque biology into the cardiologist's own clinic.

Presented by

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01 — Evidence

SCOT-HEART · PROMISE · DISCHARGE · ADVANCE

02 — Guidelines

2021 AHA/ACC Chest Pain · CAD-RADS 2.0

03 — Practice

Workflow · FFR-CT · Reimbursement

ACCME · Required disclosure

Disclosure.

In accordance with ACCME Standards for Integrity and Independence in Accredited Continuing Education, the presenter discloses the following financial relationships with ineligible companies.

Presenter	Commercial interest	Nature of relationship
Mandar Jagtap, D.O., FACC, FASE, FSCAI, FASNC	Arineta Manufacturer of the SpotLight Duo cardiac CT scanner referenced in this presentation.	Guest speaker · Speakers' bureau No other relevant financial relationships to disclose.

Mitigation of relevance

All clinical recommendations in this presentation are derived from peer-reviewed primary literature and society guidelines. No off-label use is discussed. Vendor names appear only where required to identify a referenced technology; no specific scanner platform is endorsed over another for any clinical indication.

Contents

What we'll cover.

Four arcs: the diagnostic gap that motivated CCTA, the randomized evidence that earned it a Class I recommendation, the modern reporting framework, and a pragmatic look at the office-based delivery model.

Chest pain is the test, and the test has been wrong.

Among U.S. patients referred for elective invasive coronary angiography, only **38–50%** are found to have obstructive disease. The other half undergo a procedure they did not need.

Patel MR et al., NEJM 2010 — N = 397,954 patients without known CAD.

Elective ICA — diagnostic yield

37.6%

of elective catheterizations show obstructive CAD.

In the same registry, only **44.5%** had been preceded by a noninvasive functional test. A confirmatory invasive procedure was being used as a diagnostic one.

The clinical questions this raises

Can we rule out CAD *before* the cath lab? Can we identify the patient whose plaque deserves prevention rather than revascularization? Can we do it without admitting them?

Stenosis is not biology.

Functional testing detects ischemia from obstructive lesions. But most heart attacks arise from **non-obstructive plaque** — biology that ischemia testing is blind to.

Stress ECG / SPECT / Echo

Detects flow-limiting stenosis

Answers: *does this lesion limit flow today?*

Misses: non-obstructive plaque, total plaque burden, high-risk plaque features.

PROMISE:54% of events occurred in patients with non-obstructive disease on CCTA.

Coronary CT angiography

Visualizes the artery wall

Answers: *does this patient have atherosclerosis — and how much?*

Adds: plaque burden, composition, remodeling, low-attenuation plaque, calcified vs. soft.

Enables the question functional tests cannot answer: *does this patient need a statin?*

Invasive coronary angiography

Lumenography

Answers: *can I revascularize this vessel?*

Costs: vascular access, contrast, radiation, $——. Vessel-wall blind.

In DISCHARGE, **62%** of patients referred for ICA did not have obstructive disease.

Hoffmann U et al., Circulation 2017 (PROMISE substudy) · Maurovich-Horvat P et al., NEJM 2022 (DISCHARGE).

II

Section 02 · 4 slides

Randomized evidence.

Three landmark RCTs and one large registry have moved CCTA from *nice to have* to *guideline-recommended first-line*. The signal is consistent.

2015	2018	2022	2018
PROMISE	SCOT-HEART	DISCHARGE	ADVANCE

SCOT-HEART — CCTA reduced fatal & nonfatal MI at 5 years.

Design

Open-label, parallel-group RCT · 12 Scottish centers · **N = 4,146** patients with stable chest pain · randomized to **CCTA + standard care** vs. **standard care alone**.

Primary endpoint

Death from coronary heart disease or nonfatal MI at median **4.8 years**.

Key finding

CCTA strategy **reduced the primary endpoint by 41%** (HR 0.59; 95% CI 0.41–0.84) — without an increase in invasive angiography or revascularization at 5 years.

Mechanism

Higher rates of statin initiation and anti-anginal therapy after visualizing plaque — not more stents.

Primary endpoint at 5 years

2.3% vs. 3.9%

CCTA + standard care

Standard care alone

HR 0.59

95% CI 0.41–0.84 · P = 0.004

41% relative reduction in CHD death or nonfatal MI sustained to 5 years.

SCOT-HEART Investigators. Coronary CT Angiography and 5-Year Risk of Myocardial Infarction. NEJM 2018;379:924–933.

PROMISE — anatomy was non-inferior. But it also showed something else.

Design

N = 10,003 symptomatic outpatients with suspected CAD, randomized to **CCTA** vs. **functional testing** (nuclear 68% / echo 22% / ETT 10%).

Primary endpoint · 25 months

3.3% vs. 3.0%

Death / MI / hospitalization for unstable angina / major procedural complication.

P = 0.75 — equipoise established.

What the substudies revealed

Anatomic testing reduced invasive catheterizations that turned out to be *negative* — **3.4% vs. 4.3%** (P = 0.02). Fewer normal cath labs.

The hidden finding

54% of cardiac events arose from *non-obstructive* plaque on CCTA.

Patients functional testing would have called “negative” were the ones having events — because functional testing cannot see what is not yet flow-limiting.

C-statistic for predicting MACE (PROMISE substudy)

0.747	0.657	0.629
CAD-RADS (CCTA)	Calcium score	ASCVD calculator

Douglas PS et al., NEJM 2015;372:1291–1300 · Hoffmann U et al., Circulation 2017 · Bittner DO et al., JACC Imaging 2019.

DISCHARGE — CT before catheter, even when catheter is the plan.

3,561 patients at 26 European centers, already *referred for invasive angiography* for stable chest pain, randomized to CT first vs. straight to cath. 56% women. Median follow-up 3.5 years.

MACE at 3.5 yr

2.1%

CT first
(vs. 3.0% ICA first)

HR 0.70
95% CI 0.46–1.07

Major complications

0.5%

CT first
(vs. 1.9% ICA first)

HR 0.26
95% CI 0.13–0.55

Revascularization

14.2%

CT first
(vs. 18.0% ICA first)

HR 0.76
95% CI 0.65–0.90

Obstructive CAD

25.7%

Identical in both arms — CT did not miss disease, it filtered access to it.

Takeaway

Among patients already deemed cath-worthy, a CT-first strategy delivered the same hard outcomes with a quarter the major complications — and a 24% relative reduction in revascularization.

Maurovich-Horvat P et al. CT or Invasive Coronary Angiography in Stable Chest Pain. NEJM 2022;386:1591–1602.

ISCHEMIA didn’t weaken CCTA. It defined where it goes.

A often-missed detail

CCTA was the safety screen in ISCHEMIA itself.

Before randomization, **76%** of the 5,179 ISCHEMIA participants underwent CCTA — to exclude left-main disease and confirm anatomic CAD.

In other words: the largest stable-CAD revascularization trial of the modern era used *CCTA* as the gatekeeper for who was allowed in.

What ISCHEMIA actually answered

Once obstructive CAD is known, routine revascularization didn’t reduce hard events vs. optimal medical therapy.

Primary composite at median 3.2 years: **no significant difference** between invasive and conservative strategies (HR 0.93; 95% CI 0.80–1.08).

Implication for the cardiologist

If revascularization isn’t always the answer, the *diagnosis* needs to be the right one — and CCTA finds the patient who benefits from prevention, not the cath lab.

Maron DJ et al., NEJM 2020;382:1395–1407 (ISCHEMIA) · Reynolds HR et al., Circulation 2021 (CAD severity substudy).

III

Section 03 · 3 slides

Guidelines & reporting.

The 2021 AHA/ACC Chest Pain Guideline made CCTA a **Class I, Level A** recommendation. CAD-RADS 2.0 standardized how we report it.

2021
Chest Pain Guideline

2022
CAD-RADS 2.0

MESA
CAC scoring

2021 AHA/ACC Chest Pain Guideline — CCTA goes Class I.

Recommendation class · Level of evidence

I / A

Class — strongest

Level — multi-RCT

A shift from prior US guidelines

For the first time, U.S. guidelines elevate CCTA alongside stress imaging as a **frontline diagnostic test** for patients with no known CAD — both acute and stable chest pain.

Aligns U.S. practice with ESC 2019 and U.K. NICE 2016 — which made CCTA first-line years earlier.

Where CCTA earned Class I, Level A

1	Intermediate-risk acute chest pain, no known CAD	Exclude atherosclerotic plaque and obstructive CAD — alternative to stress imaging.
2	Intermediate-to-high-risk stable chest pain, no known CAD	Diagnosis of CAD, risk stratification, and guiding therapy.
3	Stable patients with known non-obstructive CAD	CCTA *or* stress imaging reasonable (Class IIa).

Gulati M et al. 2021 AHA/ACC/Multisociety Guideline for the Evaluation and Diagnosis of Chest Pain. Circulation 2021;144:e368–e454. Estimated reach: 15–20 million U.S. patients.

CAD-RADS 2.0 — a shared language for stenosis + plaque burden.

SCCT / ACC / AHA / NASCI / ASNC consensus, 2022. Each report now carries a stenosis grade, a plaque-burden modifier, and explicit management guidance — so the next clinician knows what to do.

Grade	Stenosis	Interpretation	Recommended action
0	0%	No plaque, no stenosis	Reassure · address symptoms otherwise
1	1–24%	Minimal non-obstructive	Consider preventive therapy · risk-factor modification
2	25–49%	Mild non-obstructive	Statin · preventive Rx; no functional test needed
3	50–69%	Moderate stenosis	Consider FFR-CT or functional study
4	70–99%	Severe stenosis · 4A single-vessel · 4B LM or 3VD	ICA ± revascularization workup
5	100%	Total occlusion	ICA · viability assessment as indicated

Plaque burden modifier P1–P4: mild → extensive total plaque, independent of stenosis grade. Adds prognostic information beyond luminal narrowing alone.

Cury RC et al. CAD-RADS 2.0. JCCT 2022;16:536–557 · SCCT / ACC / AHA / NASCI / ASNC.

The calcium score — a 12-second prevention test.

Non-contrast, no IV, ~**0.89 mSv** — the radiation of a mammogram. The strongest single negative-risk marker we have for the asymptomatic intermediate-risk adult.

Indication (Class IIa, ACC/AHA)

Borderline / intermediate 10-year ASCVD risk (5–20%) where statin decision is uncertain.

15-year all-cause mortality by Agatston score · MESA-era cohort, N = 2,363

Score	CAC = 0	CAC 1–99	CAC 100–399	CAC ≥ 400
Men 15-yr mortality	3.5%	7.4%	11.2%	18.0%
Women 15-yr mortality	5.0%	12.8%	17.3%	23.5%

Why this matters in women

Framingham underestimates risk in women. In this cohort, women carried a **1.44×** higher 15-year adjusted mortality than men at the same CAC stratum — and once CAC > 10, women had higher mortality at *every* stratum.

Decision rule

CAC = 0 defers the statin conversation (15-yr warranty); CAC ≥ 100 ends it — treat. Don’t use the same threshold for women: lower CAC, higher event rate.

Kelkar AA et al., Circ Cardiovasc Imaging 2016 (low-intermediate Framingham cohort, 14.6-yr median follow-up) · Detrano R et al., NEJM 2008 (MESA) · AAFP 2022.

IV

Section 04 · 4 slides

The office model.

Modern scanners, AI workflow, FFR-CT, and a doubled Medicare rate have made cardiac CT a service the cardiologist can deliver — not just refer.

Diagnostic
FFR-CT

Operational
Workflow

Financial
Economics

Arineta SpotLight™ Duo

High-performance cardiovascular & thoracic CT — engineered for the office.

FFR-CT — physiology, without a wire.

Computational fluid-dynamics applied to the CCTA dataset. Reports lesion-specific pressure ratios — the same threshold used in the cath lab (FFR ≤ 0.80).

ADVANCE Registry · N = 5,083 · 38 sites

FFR-CT changed the management plan in two-thirds of patients vs. CCTA alone.

66.9%

Reclassified after FFR-CT

14.4%

Negative ICA when FFR-CT ≤0.80 (vs. 43.8% if >0.80)

In 4,737 analyzed scans, FFR-CT redirected 22% of CCTA-recommended revascularizations to medical therapy.

90-day safety with FFR-CT > 0.80

0

deaths or MIs among 1,592 patients with negative FFR-CT.

FFR-CT ≤ 0.80 was associated with HR **19.75** for MACE (CI 1.19–326), driven by lesions below 0.76.

Fairbairn TA et al. Real-world clinical utility of FFR$_{CT}$: the ADVANCE Registry. Eur Heart J 2018;39:3701–3711.

From order to report — 90 minutes, one visit.

Modern wide-detector scanners (≥ 64-slice, single-beat acquisition) deliver diagnostic CCTA at **sub-millisievert** doses on regular sinus rhythm patients — without admitting them or sending them to the hospital outpatient department.

Same-day office workflow

01
Intake & prep

Pre-test probability, β-blocker if HR > 65, NPO 4 h, IV access.

~30 min

02
Calcium scan

Non-contrast, prospective gating. Sets contrast / FOV decision.

~1 min

03
CCTA acquisition

Single-beat axial or high-pitch helical. 50–70 mL contrast.

~10 min

04
AI post-processing

Automated centerline, segmentation, plaque quantification.

~5 min

05
Read & CAD-RADS

Level-2 cardiologist or radiologist; report templated to CAD-RADS 2.0.

~20 min

06
Same-visit consult

Patient leaves with plan: prevention, FFR-CT, or ICA referral.

~25 min

Effective dose	Non-diagnostic rate	Median to scan (DISCHARGE)	vs. ICA
0.9–3 mSv	~6%	3 days	12 days

Achenbach S et al., Radiology 2013 (sub-mSv) · Maurovich-Horvat P et al., NEJM 2022 (DISCHARGE timings) · SCCT 2021 expert consensus.

The reimbursement door just opened.

Three Medicare changes between 2024 and 2026 have re-priced the cardiac CT stack — CCTA itself doubled, FFR-CT got its own Category I code, and AI plaque analysis became a separately payable service.

CCTA · CPT 75572–75574

Coronary CT angiography

CY 2024 HOPPS

$175.06

CY 2025 · APC 5572

$357.13

+104% vs. 2024

Aligns payment with resource intensity — the keystone change.

FFR-CT · CPT 75580

CT fractional flow reserve

Pre-2024 · Cat III 0501T

contractor priced

CY 2025 · APC 5724

$1,017.39

Category I status effective **Jan 1, 2024**.

Replaces Cat III code — predictable national payment.

AI plaque · CPT 75577

AI-enabled CT plaque analysis

Pre-2026

not separately payable

CY 2026 · APC 1511

$950.50

Category I active **Jan 1, 2026**.

Reimburses Cleerly, HeartFlow Plaque, Caristo CaRi-Plaque.

Stacked HOPPS payment

A symptomatic patient receiving CCTA + FFR-CT + AI plaque analysis is now reimbursed at **~$2,325** — up from $175 in 2024.

What this unlocks

Office programs become viable. AI plaque vendors no longer bundled into the scan rate — they have their own line item.

Caveat

APC 5572 is temporary; CMS reassesses 3–4 years out. 75577 covered only when ordered per CMS coverage article. Confirm with your MAC.

CMS CY25 & CY26 HOPPS Final Rules · SCCT HOPPS guidance 2025 · HeartFlow Coding & Billing Guide 2025 · MedAxiom CY26 OPPS Summary, Nov 2025.

Five things to leave with

What changes Monday morning.

01

For the intermediate-risk patient with stable chest pain — CCTA, not stress, is now the default.

Class I, Level A. PROMISE established equipoise; SCOT-HEART proved benefit; DISCHARGE proved safety.

02

Report stenosis with CAD-RADS 2.0 — and the plaque modifier with it.

Stenosis grade alone misses biology; the P1–P4 modifier carries prognostic weight beyond luminal narrowing.

03

A CAC of zero is a powerful negative test. A CAC of 100+ is a statin decision.

Use it for the borderline ASCVD patient where the statin conversation is uncertain.

04

FFR-CT belongs after CAD-RADS 3 — the moderate-stenosis fork.

Two-thirds of plans change. Zero MIs or deaths at 90 days when FFR-CT > 0.80.

05

The Medicare rate doubled in 2025. The office model is now financially possible.

A closing thought

2030.

Five years from now, the standard of care for chest pain will not look like the standard of care from 2019.

The cath lab is no longer the front door of cardiology.

For the first time in the history of our specialty, we can see plaque before it ruptures, quantify it before it obstructs, and treat it before it presents.

01 **From detection to prevention.**

AI plaque quantification will make preventive cardiology measurable — the way LDL and blood pressure already are.

02 **From hospital to office.**

Reimbursement, workflow, and scanner footprint have converged. The next generation trains in the office, not the reading room.

03 **From event to trajectory.**

We'll no longer treat CAD as a single moment in time. Serial imaging will let us see whether therapy is working — per patient, per year.

The question is no longer *whether* office-based cardiac CT is coming to your practice. The question is whether you'll be ready when your patients ask for it.

Arineta SpotLight™ Duo.

High-performance cardiovascular & thoracic CT — engineered for the office.

SpotLight™ Duo is the first dedicated cardiovascular and thoracic CT scanner designed to provide comprehensive clinical information for diagnosis and therapy planning.

The system uses a lower radiation dose than whole-body CT scanners.

imaging based on a single heartbeat as well as the fast speed of the scan reduce contrast volumes and reduce the need for administration of beta blocker.

Clinical applications from Calcium Scoring to Cardiac CTA and peripheral vascular imaging are executed easily and successfully even for patients with high or unstable heart rates and for obese patients

Specifications from Arineta SpotLight™ / SpotLight™ Duo product data sheet (MKT-19523EN). 510(k) cleared. This slide is sponsor recognition; clinical content of this presentation is independent of vendor selection.

Primary sources

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Guidelines & reporting

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Practice & policy

[12] CMS CY 2025 Hospital Outpatient Prospective Payment System Final Rule, Nov 2024 · **[13]** SCCT Health Policy & Practice Committee briefing on APC 5572 reclassification, 2024 · **[14]** Achenbach S et al. *Submillisievert Coronary CT Angiography.* Radiology. 2013;267(2):432–439.