

A New Paradigm in the Diagnosis and Treatment of Coronary Artery Disease:

A Real World '**CTA First**' Approach Reduces Diagnostic Invasive Coronary Angiography and Increases Cath Lab Efficiency.

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Disclosure of Relevant Financial Relationships

I, Shayan Nabavi Nouri, DO NOT have any relevant financial relationships to disclose.

Background

- Despite a class 1 (LOE A) guideline recommendation for coronary CTA, nuclear stress testing remains the more highly utilized first-line diagnostic test for coronary artery disease (CAD).
- The impact of a “**CTA first**” approach in the evaluation of CAD on the rates of diagnostic only invasive coronary angiography and cath lab utilization has yet to be evaluated in real-world clinical practice.

Background: Effectiveness of CCTA

Summary of diagnostic accuracy of noninvasive tests compared with invasive coronary angiography

Population: suspected CAD; prevalence 41-75%

Test	Sensitivity	Specificity	PPV	NPV
Exercise Electrocardiography	62%	68%	57%	72%
Stress Echocardiography	88%	89%	93%	80%
Single Photon Emission Computed Tomography	83–84%	79–85%	72–85%	84%
Positron Emission Tomography	90–91%	82–91%	94%	75–84%
Stress Magnetic Resonance Imaging	81%	87%	93%	70%
Coronary Artery Calcium Scoring	98–99%	35–40%	65–68%	93–95%
Coronary Computed Tomography Angiography (Low radiation dose)	100%	89%	93%	99%
Coronary Computed Tomography Angiography (Radiation dose not specified)	98.20%	81.60%	90.50%	99.00%

Noninvasive Testing for Coronary Artery Disease [Internet]. Comparative Effectiveness Reviews, No. 171.

Skelly AC, Hashimoto R, Buckley DI, et al.

Rockville (MD): [Agency for Healthcare Research and Quality \(US\)](#); 2016 Mar.

Background: Paradigm Shifting

Meaning Compared with functional stress testing, coronary computed tomography angiography is associated with a decreased incidence of myocardial infarction in patients with suspected coronary artery disease, as well as an increase in the detection of coronary artery disease and use of secondary prevention medications; trade offs involve an increase in downstream invasive procedures, many of which may be unnecessary.

Coronary Computed Tomography Angiography vs Functional Stress Testing for Patients With Suspected Coronary Artery Disease A Systematic Review and Meta-analysis

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Objective

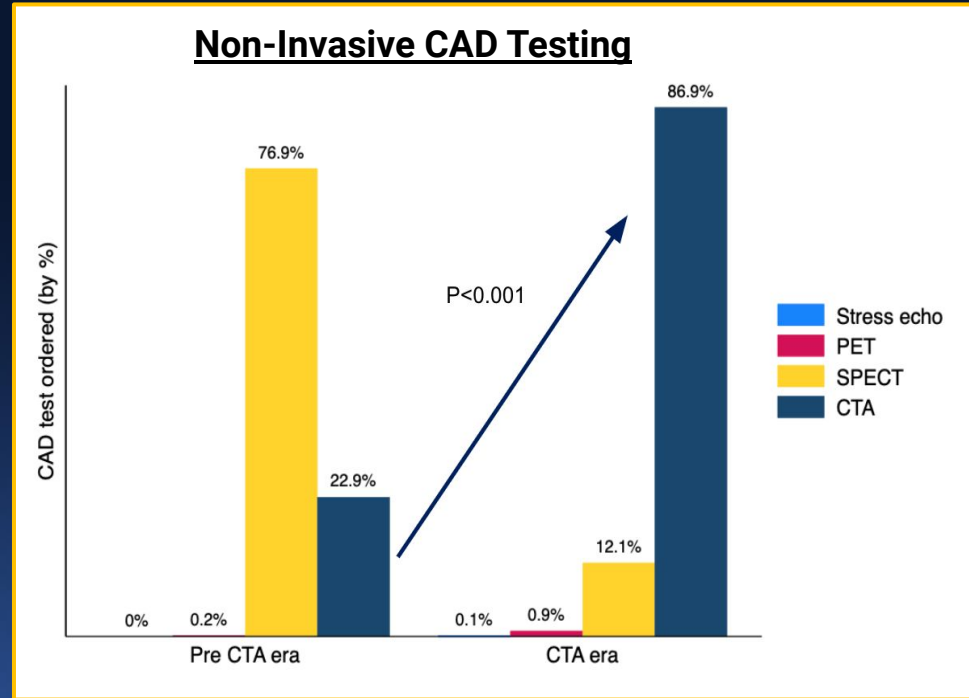
- To evaluate the impact of a “**CTA first**” approach in the evaluation of CAD on the rates of diagnostic only invasive coronary angiography and cath lab utilization

Methods

- Imaging orders and claims data in a large cardiovascular practice were evaluated from 2019 to 2023.
- Based on the implementation of coronary CTA (+FFR_{CT} when appropriate and available) as the initial modality for evaluation of CAD
 - “pre-CTA era” (January 2019-April 2020)
 - “CTA era” (May 2020-May 2023)
- Trends in CAD diagnostic testing and diagnostic invasive coronary angiography were assessed.

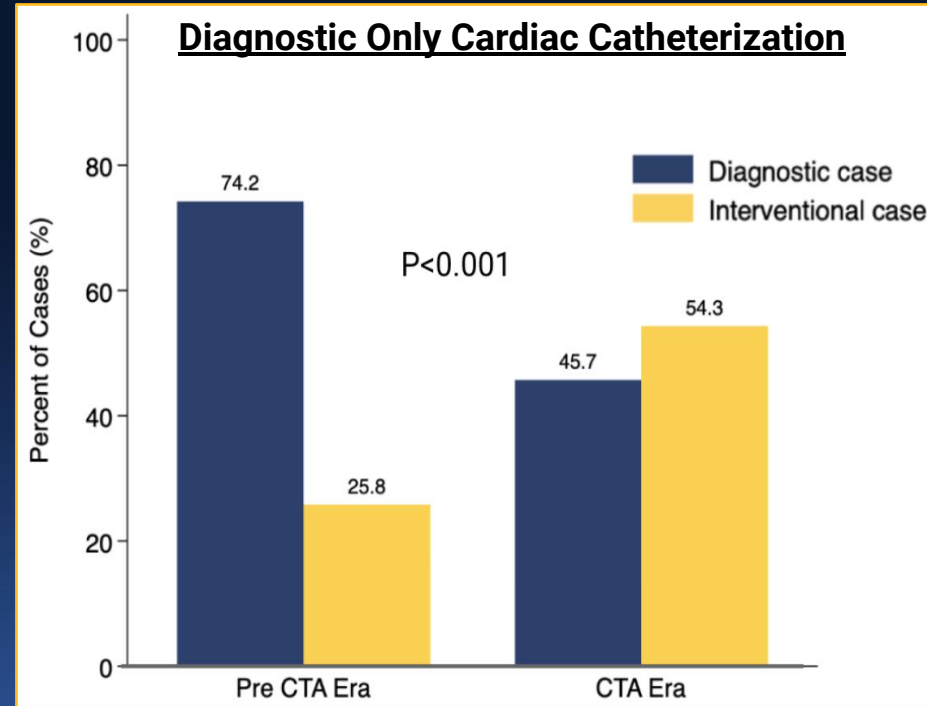
Results: Non-Invasive Testing

- A total of **2,062 patients** were evaluated for CAD using either stress testing or CTA
 - 524 in the **pre-CTA** era and
 - 1,538 in the **CTA era**.
- In the transition from pre-CTA to CTA eras:
 - **CTA increased** from 22.9% to 86.9%
 - FFR_{CT} in 20-30% of cases
 - **Stress testing declined** from 77.1% to 13.0% (p<0.001).



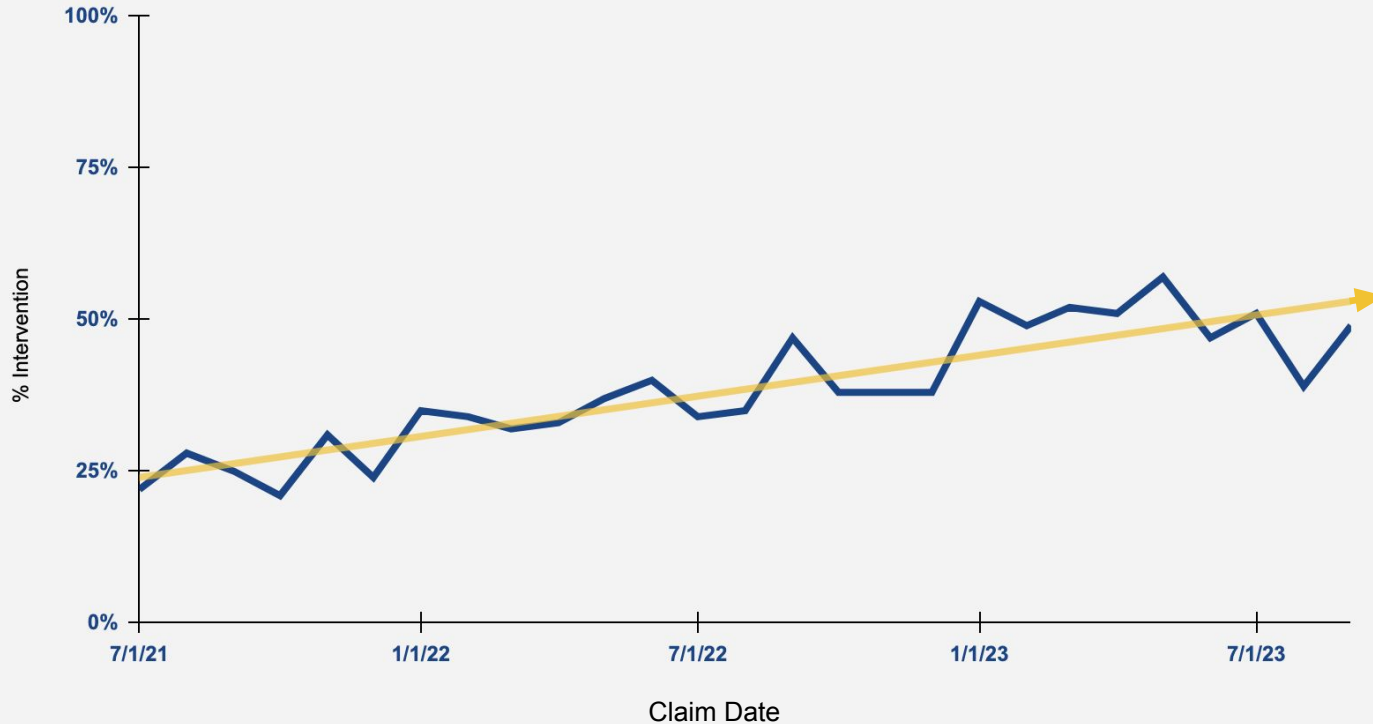
Results: Avoidable Invasive Angiography

- For patients undergoing invasive coronary angiography, rates of **“diagnostic only” procedures declined** significantly from the pre-CTA to CTA era
 - 74.2% (115/155)
vs.
45.7% (106/232), $p < 0.001$
- **Rates of intervention thereby increased** from 25.8% to 54.3% ($p < 0.001$) from the pre-CTA to CTA era.



Results: Avoidable Invasive Angiography

Sorin Medical % Interventional Caths



Conclusions:

CTA + FFR_{CT} first approach in evaluating CAD **improved** cardiac catheterization lab **efficiency** by **reducing** potentially **avoidable** diagnostic only invasive coronary angiography.