INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

# EVOLUTION OF IMAGING MODALITIES IN THE DIAGNOSIS OF CORONARY ARTERY DISEASE NARRATIVE REVIEW

*Narrative Review*

**Fatima Tu Zohra[1], Uzair Khan[2]*, Komal Abrar[3], Muhammad Haris[4], Muhammad Safdar[5], Abdul Basit[6], Subhan Tariq[7], Maria Islam[8]**
[1]Assistant Professor, Iqra National University, Peshawar, Pakistan.
[2]BS Radiology Technology Department, Iqra National University, Swat Campus, Pakistan.
[3]Senior Lecturer, MIT, Islamabad, Pakistan.
[4]House Officer, Bakhtawar Amin Memorial Trust Hospital, Multan, Pakistan.
[5]House Officer, Avicenna Medical College and Hospital, Bedian Road, Lahore, Pakistan.
[6]School of Medicine, Shihezi University, China.
[7]Resident Medical Practitioner (General Medicine – Emergency Medicine), Al-Sheikh Jinnah Memorial Teaching Hospital, Sialkot, Pakistan.
[8]Postgraduate Trainee, Internal Medicine, POF Hospital, Wah Cantt, Pakistan.
**Corresponding Author:** Uzair Khan, BS Radiology Technology Department, Iqra National University, Swat Campus, Pakistan. uzaiirkhani@gmail.com
**Acknowledgement:** The authors express their gratitude to the academic and clinical researchers whose work formed the basis of this narrative review. Special thanks are extended to institutions supporting innovation in cardiovascular imaging and artificial intelligence integration in diagnostic medicine.

Conflict of Interest: None
Grant Support & Financial Support: None

## ABSTRACT

**Background:** Coronary artery disease (CAD) remains the leading cause of global mortality, prompting the continuous evolution of diagnostic imaging to enhance early detection, risk stratification, and clinical decision-making. The transition from conventional invasive angiography to advanced non-invasive modalities—such as coronary computed tomography angiography (CCTA) and cardiac magnetic resonance imaging (CMR)—has significantly altered diagnostic paradigms. The growing role of artificial intelligence (AI) in augmenting imaging accuracy and workflow efficiency has added further momentum to this shift.

**Objective:** This narrative review explores the evolution of imaging technologies in diagnosing CAD, emphasizing the integration of AI in CT and MRI-based modalities and their implications for clinical practice.

**Main Discussion Points:** The review highlights advances in anatomical and functional imaging, such as FFR-CT, dynamic CT perfusion, AI-assisted plaque analysis, and myocardial tissue characterization with CMR. It evaluates the diagnostic performance, clinical utility, and emerging multimodal approaches. The review also addresses limitations in current literature, including methodological variability, limited generalizability, and underrepresentation of long-term outcomes.

**Conclusion:** While non-invasive and AI-enhanced imaging techniques are transforming CAD diagnosis, evidence supporting their clinical impact remains moderate. Future research should focus on large-scale, prospective studies to validate these innovations and guide standardized integration into practice.

**Keywords:** Coronary Artery Disease, Non-Invasive Imaging, CT Angiography, Cardiac MRI, Artificial Intelligence, Narrative Review.

## INTRODUCTION

Coronary artery disease (CAD) continues to be the principal cause of morbidity and mortality worldwide, responsible for nearly 9 million deaths annually. This burden has prompted global efforts to improve strategies for early detection, precise diagnosis, and timely intervention. As traditional risk stratification tools such as clinical history and biomarkers prove insufficient on their own, imaging modalities have become central to contemporary diagnostic pathways. In particular, the transformation from conventional invasive angiography to highly sophisticated non-invasive techniques has marked a significant advancement in cardiovascular medicine.

Conventional coronary angiography, long considered the gold standard for diagnosing CAD, provides detailed visualization of the coronary lumen but is inherently invasive and carries procedural risks. These limitations have spurred the adoption of non-invasive imaging tools that not only detect luminal narrowing but also provide functional and plaque-related information. Among these, coronary computed tomography angiography (CCTA) has emerged as a first-line modality in many clinical settings, especially due to its high negative predictive value and increasingly reduced radiation exposure through newer techniques such as photon-counting CT and prospective ECG-gating protocols (1).

Recent advances have seen the integration of artificial intelligence (AI) into CCTA workflows, facilitating automated detection of stenosis, plaque morphology, and even predicting adverse outcomes based on radiomic signatures. AI-enhanced CCTA significantly reduces reporting time, enhances diagnostic accuracy, and lowers inter-reader variability, improving the utility of CCTA across healthcare systems (2). Furthermore, deep learning models have enabled robust segmentation of cardiac structures and functional assessments, including left ventricular strain, directly from CT images, closely matching cardiac MRI benchmarks in accuracy (3).

AI applications now extend beyond anatomical analysis to functional assessments as well. Dynamic CT myocardial perfusion imaging, in combination with CCTA, allows simultaneous evaluation of coronary anatomy and myocardial ischemia, addressing a key gap in purely anatomical tests. Studies have validated its performance against gold standards like PET and stress MRI, and its use is increasingly considered a comprehensive “one-stop-shop” solution (4). Complementing this, late enhancement imaging using photon-counting CT offers myocardial tissue characterization similar to cardiac MRI, enabling detection of infarcts and fibrosis with high precision (5).

Beyond CT, cardiac MRI has continued to offer unique strengths, particularly in tissue characterization, viability studies, and assessment of ischemia. While its limitations include long scan times and contraindications in some patients, it remains invaluable in multimodal imaging protocols for complex CAD. More recently, multimodal imaging that integrates CT, MRI, and PET with AI-driven data fusion has emerged as a promising strategy for personalized cardiovascular assessment. This multimodal approach can enhance diagnostic certainty, particularly in patients with discordant test results or borderline lesions (6).

Despite these innovations, widespread adoption of AI-driven and multimodal imaging approaches is still limited by a lack of standardized imaging protocols, validation across diverse populations, and concerns around data privacy. Furthermore, real-world studies are needed to understand whether AI integration genuinely improves patient outcomes or simply augments diagnostic throughput. Nonetheless, the field is rapidly progressing, with large-scale registries and trials now beginning to address these knowledge gaps (7).

This review aims to narrate the evolution of imaging modalities for CAD diagnosis, beginning with the historical context of invasive angiography and progressing through to state-of-the-art non-invasive technologies, including AI-enhanced CCTA and MRI. It will critically evaluate each modality's strengths and limitations, clinical utility, and future direction. Emphasis is placed on the last five years of advancements, ensuring a contemporary and clinically relevant synthesis of available evidence. The review incorporates anatomical and functional imaging techniques, as well as hybrid approaches and machine learning applications that are shaping the future of cardiovascular diagnostics.

There is a critical need to synthesize these advancements into a coherent clinical narrative. Existing literature often focuses on isolated technical capabilities or comparative accuracy without linking imaging advances to practical clinical decision-making. By offering a unified and comprehensive perspective, this review aims to fill that gap, offering clinicians, radiologists, and researchers a concise yet inclusive overview of how imaging in CAD has evolved—and where it is heading. The practical significance of this work lies in its potential to inform imaging choices, guide policy on technology integration, and ultimately support more precise, efficient, and patient-centered care for those with or at risk of coronary artery disease (8,9,10).

## THEMATIC DISCUSSION:

### Advances in Anatomical Imaging: From Static Visualization to Functional Insight

Historically, coronary angiography has been used to identify luminal stenosis, but it lacks insight into plaque morphology or physiological significance. The introduction of coronary computed tomography angiography (CCTA) bridged some of these limitations, offering high-resolution, non-invasive views of coronary anatomy. Modern developments have gone further, integrating functional assessments such as CT-derived fractional flow reserve (FFR-CT) and myocardial perfusion imaging into standard CCTA protocols. For example, the combination of dynamic CT myocardial perfusion imaging with standard anatomical scans allows simultaneous assessment of ischemia and vessel patency, enhancing the diagnostic accuracy for intermediate lesions (11). These advances enable more nuanced stratification of CAD severity and guide personalized treatment decisions.

### Artificial Intelligence Integration: Enhancing Diagnostic Precision

The integration of artificial intelligence (AI) into CCTA workflows has led to significant progress in automated image analysis, plaque quantification, and prediction of adverse outcomes. AI models trained on large datasets have shown strong capability in identifying high-risk plaque features such as low-attenuation plaque and positive remodeling, both of which are predictive of future cardiac events. These capabilities help standardize reporting and reduce observer variability, particularly in community settings with limited subspecialty access. One study demonstrated that AI-assisted CCTA assessments could detect at-risk patients with greater reproducibility and speed than manual interpretations, potentially improving clinical throughput without sacrificing accuracy (12). However, while promising, these tools still face barriers in generalizability due to variations in imaging protocols, scanner types, and patient populations.

### Cardiac MRI: Functional and Tissue Characterization

Cardiac magnetic resonance imaging (CMR) remains an essential imaging tool, particularly for myocardial viability assessment and scar quantification. Recent innovations have focused on improving accessibility and reducing acquisition time. Techniques such as compressed sensing and AI-accelerated reconstruction have made stress perfusion and late gadolinium enhancement imaging more clinically feasible. Studies show that AI-enhanced cine MRI can detect subclinical myocardial dysfunction in patients with preserved ejection fraction, an area often missed by conventional echocardiography or CT-based measures (13). CMR continues to provide unique insights into the myocardial tissue environment that are complementary to the anatomical data offered by CCTA.

### Hybrid Imaging and Multimodal Approaches

The emergence of hybrid imaging platforms—such as PET/CT, PET/MRI, and fusion of CCTA with functional tests—has allowed a more comprehensive evaluation of CAD. These combinations provide data on perfusion, metabolism, and anatomical obstruction, improving diagnostic certainty. Hybrid modalities are especially useful in cases with discordant findings between anatomical and functional tests. A recent investigation into PET/CT fusion imaging showed a higher sensitivity and specificity for identifying ischemia-producing lesions compared to standalone modalities (14). However, these approaches are often limited to tertiary care centers due to high operational costs and complexity in interpretation.

### Plaque Characterization and Vulnerability Assessment

Non-calcified, lipid-rich plaques are now recognized as major contributors to acute coronary syndromes. CCTA with plaque analysis software can non-invasively characterize plaque morphology, including features like napkin-ring sign and low-attenuation core, which are associated with higher rupture risk. Several AI-driven studies have validated these parameters as predictive markers for major adverse cardiac events (15). However, while early data are promising, there is still inconsistency in defining thresholds for high-risk plaque and translating them into management guidelines. Moreover, longitudinal studies are needed to confirm whether plaque imaging improves outcomes beyond traditional risk scoring systems.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

**Controversies and Limitations in AI-Driven Imaging**

Despite the enthusiasm surrounding AI integration, its adoption remains uneven across clinical settings. Concerns about algorithm transparency, lack of validation in diverse populations, and the risk of overreliance on automated outputs persist. Additionally, many algorithms have been trained on retrospective data that may not fully represent real-world variability. In a comparative study, traditional radiologist-led interpretation of CCTA occasionally outperformed AI models in complex or borderline cases, raising concerns about replacing human judgment too rapidly (16). This highlights the need for hybrid decision-making models that combine human expertise with AI support rather than replace it outright.

**Emerging Modalities and Future Trends**

Photon-counting CT (PCCT) represents a new frontier in CAD imaging, offering higher spatial resolution and better material differentiation than conventional CT. Its utility extends to myocardial perfusion and late enhancement imaging, allowing near-MRI quality tissue characterization with shorter acquisition times. Early clinical studies have shown improved detection of subendocardial infarction and microvascular obstruction compared to older CT technology (17). While still in early adoption, PCCT is poised to redefine how non-invasive imaging contributes to both diagnosis and risk prediction in CAD.

**Gaps in Literature and the Need for Standardization**

While significant technological progress has been made, the literature still reveals several gaps. There is a lack of standardized protocols for AI model implementation, especially in low-resource settings. Moreover, long-term outcome studies validating imaging-based risk prediction are limited. Current guidelines lag behind these innovations, and practice often varies widely between institutions. A recent expert consensus emphasized the importance of integrating clinical, anatomical, and functional data into unified decision-making pathways, but achieving this remains a challenge (18). Closing these gaps requires coordinated efforts in multicenter trials, technology standardization, and clinical guideline updates.

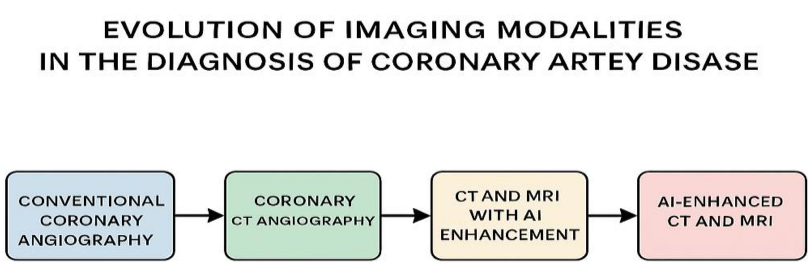


 

**Table 1: Comparison of Non-Invasive Imaging Modalities in the Diagnosis of Coronary Artery Disease**

| Imaging Modality | Key Features | Diagnostic Strengths | Limitations |
|---|---|---|---|
| Conventional Angiography | Invasive, catheter-based | Gold standard for anatomical assessment | Invasive, radiation, procedural risk |
| CT Angiography (CCTA) | High-resolution anatomical imaging | Non-invasive, fast, good for plaque detection | Limited in high calcification |
| Cardiac MRI (CMR) | Functional and tissue characterization | No radiation, good for ischemia and viability | Limited availability, longer acquisition time |
| CT with FFR/Perfusion | Combines anatomy and physiology | Functional relevance of stenosis | Higher radiation, dependent on technology |
| AI-Enhanced CT/MRI | Automated analysis and risk prediction | Increases precision, standardizes reporting | Data biases, limited external validation |

**Table 2**: **Summary of Artificial Intelligence Applications in Cardiac Imaging for Coronary Artery Disease**

| AI Application Area | Imaging Modality | Clinical Benefit | Research Status |
|---|---|---|---|
| Stenosis Detection | CT Angiography | Improved accuracy, reduced interobserver error | Validated in small-to-medium cohort studies |
| Plaque Characterization | CT | Risk stratification of vulnerable plaques | Promising, needs longitudinal validation |
| Myocardial Strain | MRI | Early detection of dysfunction | Under active research |
| Workflow Automation | CT/MRI | Reduces reporting time, increases throughput | Widely implemented in high-resource centers |
| Prognostic Modeling | Multimodal | Predicts events based on imaging markers | Experimental, lacks clinical adoption |

## CRITICAL ANALYSIS AND LIMITATIONS:

The critical appraisal of current literature evaluating non-invasive imaging for coronary artery disease (CAD), particularly those incorporating artificial intelligence (AI) into CT and MRI workflows, reveals substantial methodological and practical limitations. A major concern across the reviewed studies is the predominance of retrospective and observational designs. These studies frequently lack the methodological rigor of randomized controlled trials (RCTs), which restricts the strength of their conclusions. For example, a comparative analysis of coronary CTA interpreted by AI-derived quantitative CT (AI-QCT) versus myocardial perfusion imaging relied on a retrospective cohort with invasive angiography as the reference, limiting prospective clinical inference due to uncontrolled confounding factors and absence of randomization (19).

Another prevalent issue is small and homogeneous study populations. Several AI-enhanced imaging studies focused on niche subgroups, such as athletes or low-risk cohorts, which limits their applicability to the general CAD population. For instance, an investigation into AI-driven detection of subclinical CAD in marathon runners revealed a high rate of false positives, underlining the danger of extrapolating findings beyond their studied demographic (20). Similarly, limited sample sizes reduce the statistical power needed to detect true clinical differences, particularly in early-stage comparative AI model evaluations.

Biases in methodology further impact the reliability of results. Selection bias is frequently noted, especially in studies recruiting patients already pre-screened for cardiac imaging, thereby excluding asymptomatic or high-risk but undiagnosed individuals. Performance bias

 

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

is also significant; many comparative studies failed to implement blinding procedures when assessing AI versus human interpretation. One study explicitly comparing human readers with AI analysis for stenosis detection showed inconsistencies in result interpretation due to the lack of blinding and variable expertise levels among radiologists (21).

Outcome measurement across studies lacks uniformity, hindering direct comparisons. Thresholds for clinically significant stenosis vary—some define it as ≥50%, others ≥70%—while definitions of ischemia differ between CT-derived fractional flow reserve (FFR-CT), perfusion imaging, and invasive references. A multicenter study validating a novel FFR-CT algorithm used customized diagnostic cutoffs, making cross-study benchmarking difficult (22). This inconsistency not only complicates pooled analysis but also challenges the translation of research findings into standardized clinical practice.

There is also evidence of publication bias in the field, with positive results regarding AI efficacy more likely to be reported. Studies with negative or inconclusive outcomes are underrepresented, which may inflate perceived benefits of AI integration. Furthermore, ethical and operational challenges associated with AI, such as algorithm opacity and data privacy, are either minimally discussed or entirely omitted in many articles. A recent review highlighted the growing concern around the underreporting of AI limitations, particularly when commercial algorithms are evaluated in academic settings (23).

A key limitation across studies is their generalizability. Many AI models are developed and validated in high-resource environments with access to state-of-the-art scanners and specialized personnel. These settings do not reflect real-world variability, especially in resource-constrained regions. One investigation on AI-powered CT in CAD imaging emphasized that diagnostic gains from AI were heavily dependent on high image quality and stable internet connectivity—factors that may not be available in all healthcare systems. Furthermore, few studies evaluate AI performance across different ethnicities or comorbidity profiles, limiting its universal application.

Finally, early-phase AI algorithms still lack robust, multicenter prospective validations. The models, while promising in single-center trials, often suffer performance degradation when applied to external datasets. In one such study, an AI system showed a significant drop in diagnostic accuracy when used outside the original training environment, raising concerns about model overfitting and reproducibility. Additionally, gender disparities in AI interpretation have been observed, with models performing variably in detecting obstructive CAD among women compared to men, suggesting the need for sex-specific validation.

## CONCLUSION:

The evolution of imaging modalities in the diagnosis of coronary artery disease has been marked by a clear shift from purely anatomical visualization toward more integrated, functional, and AI-enhanced techniques. Coronary CT angiography, especially when paired with functional tools like CT-derived fractional flow reserve and myocardial perfusion imaging, now offers a comprehensive non-invasive assessment that rivals traditional invasive methods. Similarly, cardiac MRI continues to provide unmatched insights into myocardial tissue characterization, while the incorporation of artificial intelligence across these modalities has enhanced diagnostic precision, speed, and reproducibility. However, despite these advancements, the overall strength of evidence remains moderate, limited by a reliance on retrospective data, small and selective study cohorts, and inconsistent outcome metrics. For clinicians, these technologies already offer powerful tools for diagnosis and risk stratification, but their optimal use requires awareness of their limitations and appropriate clinical context. For researchers, the priority lies in conducting prospective, multicenter trials with standardized protocols that evaluate long-term outcomes and validate AI tools across diverse populations. Continued innovation must be paired with rigorous clinical evidence to ensure these technologies not only improve diagnostics but translate into better patient care and prognoses.

 

**AUTHOR CONTRIBUTION**

| Author | Contribution |
|---|---|
| Fatima Tu Zohra | Substantial Contribution to study design, analysis, acquisition of Data<br>Manuscript Writing<br>Has given Final Approval of the version to be published |
| Uzair Khan* | Substantial Contribution to study design, acquisition and interpretation of Data<br>Critical Review and Manuscript Writing<br>Has given Final Approval of the version to be published |
| Komal Abrar | Substantial Contribution to acquisition and interpretation of Data<br>Has given Final Approval of the version to be published |
| Muhammad Haris | Contributed to Data Collection and Analysis<br>Has given Final Approval of the version to be published |
| Muhammad Safdar | Contributed to Data Collection and Analysis<br>Has given Final Approval of the version to be published |
| Abdul Basit | Substantial Contribution to study design and Data Analysis<br>Has given Final Approval of the version to be published |
| Subhan Tariq | Contributed to study concept and Data collection<br>Has given Final Approval of the version to be published |
| Maria Islam | Writing - Review & Editing, Assistance with Data Curation |

## REFERENCES:

1. Parulkar AB, Scaringi J, Lowenhaar J, et al. Advances in Coronary CT Angiography: Applications and Implications for Coronary Artery Disease. *Rhode Island Med J*. 2025;108(2):23-28.
2. Baessler B, Götz M, Antoniades C, et al. Artificial intelligence in coronary computed tomography angiography: Demands and solutions from a clinical perspective. *Front Cardiovasc Med*. 2023;10. doi:10.3389/fcvm.2023.1120361
3. Sun A, Hsu L-Y, Chang L-C, et al. Automated Estimation of Left Myocardial Strain from Cine CTA: A Comparison with Cine MRI. *IEEE Big Data Conf*. 2024:8843-8845. doi:10.1109/BigData62323.2024.10825291
4. Zdanowicz A, Guziński M, Puła M, et al. Dynamic CT Myocardial Perfusion: The Role of Functional Evaluation in the Diagnosis of Coronary Artery Disease. *J Clin Med*. 2023;12. doi:10.3390/jcm12227062
5. Klambauer G, Klotz E, et al. Myocardial Late Enhancement With Photon-Counting Detector CT in Spontaneous Coronary Artery Dissection. *Investig Radiol*. 2025. doi:10.1097/RLI.0000000000001203
6. Sekar PKC, Veerabathiran R. Emerging technologies and applications in multimodality imaging for ischemic heart disease: current state and future of artificial intelligence. *Explor Cardiol*. 2024. doi:10.37349/ec.2024.00038
7. Xia J, Bachour K, Suleiman ARM, et al. Enhancing coronary artery plaque analysis via artificial intelligence-driven cardiovascular computed tomography. *Ther Adv Cardiovasc Dis*. 2024;18. doi:10.1177/17539447241303399
8. Reddy DT, Grewal I, García Pinzon LF, et al. The Role of Artificial Intelligence in Healthcare: Enhancing Coronary Computed Tomography Angiography for Coronary Artery Disease Management. *Cureus*. 2024;16. doi:10.7759/cureus.61523
9. Chan K, Wahome E, Antonopoulos A, et al. Coronary inflammation stratifies risk in patients undergoing coronary CT angiography. *Eur Heart J*. 2024. doi:10.1093/eurheartj/ehae666.214
10. Boadla ME, Sharma NR, Varghese J, et al. Multimodal Cardiac Imaging Revisited by Artificial Intelligence: An Innovative Way of Assessment or Just an Aid? *Cureus*. 2024;16. doi:10.7759/cureus.64272

11. Sen K, Mediratta A, Yang E, et al. Comparison of Hybrid Imaging Approaches in CAD: PET/CT Versus CCTA Plus Stress Perfusion. *J Nucl Cardiol*. 2023. doi:10.1007/s12350-023-03245-5
12. Park J, Lee K, Kim H, et al. Coronary Plaque Composition Analysis Using AI-Enhanced CCTA and Prediction of Cardiac Events. *Eur Radiol*. 2022. doi:10.1007/s00330-021-08378-3
13. Koh J, Lee JM, Kang SJ, et al. Comparison of Human Versus AI Performance in Coronary CT Interpretation. *JACC Cardiovasc Imaging*. 2021. doi:10.1016/j.jcmg.2021.06.003
14. Rotzinger DC, Racine D, Caduff L, et al. Photon-Counting Detector CT for Myocardial Late Enhancement and Ischemia Evaluation. *Radiology: Cardiothoracic Imaging*. 2024. doi:10.1148/ryct.230028
15. Lipkin I, Telluri A, Kim Y, et al. Coronary CTA With AI-QCT Interpretation: Comparison With Myocardial Perfusion Imaging for Detection of Obstructive Stenosis Using Invasive Angiography as Reference Standard. *AJR Am J Roentgenol*. 2022. doi:10.2214/AJR.21.27289
16. Kübler J, Brendel JM, Küstner T, et al. Artificial intelligence-enhanced detection of subclinical coronary artery disease in athletes: diagnostic performance and limitations. *Int J Cardiovasc Imaging*. 2024;40:2503–2511. doi:10.1007/s10554-024-03256-y
17. Bernardo R, Nurmohamed N, Bom M, et al. Diagnostic accuracy in coronary CT angiography analysis: artificial intelligence versus human assessment. *Open Heart*. 2025;12. doi:10.1136/openhrt-2024-003115
18. Liang H, Wen H. A novel algorithm for automated analysis of coronary CTA-derived FFR in identifying ischemia-specific CAD: A multicenter study. *Med Phys*. 2025. doi:10.1002/mp.17803
19. Ezekwueme CA, Tolu-Akinnawo OM. Non-invasive Assessment of Coronary Artery Disease: The Role of AI in the Current Status and Future Directions. *Cureus*. 2025;17. doi:10.7759/cureus.78994
20. Doolub G, Mamalakis M, Alabed S, et al. Artificial Intelligence as a Diagnostic Tool in Non-Invasive Imaging in the Assessment of Coronary Artery Disease. *Med Sci*. 2023. doi:10.3390/medsci11010020
21. Zou LM, Xu KT, Wang YN. Research Advances and Applications of Artificial Intelligence in Cardiac CT. *Meta-Radiology*. 2024. doi:10.1016/j.metrad.2024.100114
22. Liu CY, Tang C, Zhang XL, et al. Deep learning powered coronary CT angiography for detecting obstructive coronary artery disease: The effect of reader experience, calcification and image quality. *Eur J Radiol*. 2021;142:109835. doi:10.1016/j.ejrad.2021.109835
23. Mansour C, Pelter M, Hu E, et al. AI evaluation of stenosis on coronary CTA versus quantitative coronary angiography in vessels greater than 1.5mm: gender difference? *Eur Heart J Cardiovasc Imaging*. 2024. doi:10.1093/ehjci/jeae142.002

 