CAD-RADS™: Coronary Artery Disease — Reporting and Data System.

An Expert Consensus Document of the Society of Cardiovascular Computed Tomography (SCCT), the American College of Radiology (ACR) and the North American Society for Cardiovascular Imaging (NASCI). Endorsed by the American College of Cardiology

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Abstract

The intent of CAD-RADS — Coronary Artery Disease Reporting and Data System is to create a standardized method to communicate findings of coronary CT angiography (coronary CTA) in order to facilitate decision-making regarding further patient management. The suggested CAD-RADS classification is applied on a per-patient basis and represents the highest-grade coronary artery lesion documented by coronary CTA. It ranges from CAD-RADS 0 (Zero) for the complete absence of stenosis and plaque to CAD-RADS 5 for the presence of at least one totally occluded coronary artery and should always be interpreted in conjunction with the impression found in the report. Specific recommendations are provided for further management of patients with stable or acute chest pain based on the CAD-RADS classification. The main goal of CAD-RADS is to standardize reporting of coronary CTA results and to facilitate communication of test results to referring physicians along with suggestions for subsequent patient management. In addition, CAD-RADS will provide a framework of standardization that may benefit education, research, peer-review and quality assurance with the potential to ultimately result in improved quality of care.

Key Words: Coronary artery disease, coronary CTA, CAD-RADS, reporting and data system, stenosis severity, report standardization terminology

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CONDENSED ABSTRACT

CAD-RADS is a standardized reporting system for coronary CTA results on a per-patient basis. It is intended to improve communication of results to referring physicians in a consistent fashion, including recommendations for further management. The achieved standardization of reporting will benefit education, research, peer review and quality assurance and may ultimately result in improved quality of care.

1. INTRODUCTION

Coronary CT Angiography (coronary CTA) has made substantial progress since the introduction of 64-slice CT scanners approximately 10 years ago [1], both concerning imaging technology and clinical validation. In parallel, several professional societies have issued guidelines, expert consensus documents, and Appropriateness Criteria for coronary CTA [2-8]. To maximize the clinical impact of coronary CTA, imaging protocols must be optimized with respect to image quality, diagnostic accuracy, and radiation dose. Training and interpretation standards are important. Finally, standardized reporting is helpful to decrease variability among practitioners and may provide further benefit by linking the final impression in the report with suggestions for further patient management.

Other fields in medical imaging (notably, breast imaging with BI-RADS) have introduced standardized reporting linked with actionable information to guide next steps in patient management [9]. BI-RADS standardized reporting of screening mammograms allows clinicians to interpret the clinical relevance of reported findings and to take action. Moreover, BI-RADS facilitates collection of data for registries and databases, allowing better tracking of individual patient outcomes with specific imaging findings.

Next to BI-RADS, standardized reporting has been introduced for several other fields. They include, for example:

- LI-RADS™ (Liver Imaging Reporting and Data System) for standardization reporting in patients with chronic liver disease [10].
- Lung-RADS™ (Lung CT Screening Reporting and Data System) for standardization reporting of high-risk smokers undergoing CT lung screening [11].
- PI-RADS™ (Prostate Imaging Reporting and Data System) for multi-parametric MR imaging in the context of prostate cancer [12].

The purpose of this document is to describe a standardized reporting system for patients undergoing coronary CTA. The report system is named CAD-RADS (Coronary Artery Disease Reporting and Data System) and is applicable to coronary CTA in patients with suspected or known coronary artery disease either in the outpatient, inpatient or emergency department setting. It includes suggestions regarding further patient management, which, obviously will always need to be seen in light of the full clinical information available to the treating physician. For the specific setting of coronary CTA in patients with acute chest pain presenting to the emergency department, certain management recommendations have been reported previously [13,14].

The goal of CAD-RADS, through standardization of report terminology for coronary CTA, is to improve communication between interpreting and referring physicians, facilitate research, and offer mechanisms to contribute to peer review and quality assurance, ultimately resulting in improvements to quality of care. Importantly, CAD-RADS does not substitute the impression section provided by the reading physician and should always be interpreted in conjunction with the more individual and patient-specific information found in the report.

2. CLINICAL VALUE OF CORONARY CT ANGIOGRAPHY

Several recent prospective trials have evaluated the clinical utility of coronary CTA and the relevance of CT findings

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