



Effective Health Care

Computed Tomography Angiography for the Diagnosis of Coronary Artery Disease

Results of Topic Selection Process & Next Steps

- *Computed Tomography Angiography for the Diagnosis of Coronary Artery Disease* was found to be addressed by a 2016 Agency for Healthcare Research and Quality (AHRQ) systematic review. Given that this recent systematic review covers this nomination, no further activity will be undertaken on this topic.
 1. Skelly AC, Hashimoto R, Buckley DI, Brodt ED, Noelck N, Totten AM, Lindner JR, Fu R, McDonagh M. Noninvasive Testing for Coronary Artery Disease. Comparative Effectiveness Review No. 171. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2012-00014-I.) AHRQ Publication No. 16-EHC011-EF. Rockville, MD: Agency for Healthcare Research and Quality; March 2016.
www.effectivehealthcare.ahrq.gov/reports/final.cfm.

Topic Description

Nominator(s): The Medicaid Medical Directors Learning Network (MMDLN)

Nomination Summary: The nominator is interested in the efficacy of computed tomography angiography (CTA) for diagnosing coronary artery disease (CAD). Specifically, after clarification from the nominator, the nominator is interested in diagnostic accuracy, health outcomes, cost, and harms of CTA for the diagnosis of CAD rather than calcium scoring for risk assessment.

Staff-Generated PICO

Population(s): Patients without known CAD who present with acute symptoms suspicious for myocardial infarction (MI) and patients with known CAD (e.g., prior angioplasty and/or stent placement) who have a change in symptoms. Secondary population to consider is patients without known CAD who present with symptoms suggestive of chronic or unstable angina.

Intervention(s): CTA (64 slice and greater) alone or adjunctive to catheter angiography.

Comparator(s): Other noninvasive technologies (including CTA (with different slice), magnetic resonance imaging, echocardiography, stress EKG testing) or catheter angiography.

Outcome(s): Harms (e.g., cumulative effect of radiation, incidental findings, false positive readings), diagnostic accuracy, cost, and improvements in health outcomes.

Setting(s): Emergency department, primary care, and cardiologist's office.

Key Questions from Nominator: None.

Revised Key Questions:

What is the efficacy of CTA for the diagnosis of CAD?

Considerations

- Coronary artery disease (CAD) is the most common type of heart disease, and is also a leading cause of death in both genders in the United States.² It is characterized by the narrowing and hardening of arteries that feed blood to the heart. It is most often caused by a buildup of cholesterol (plaque), called atherosclerosis. The lack of blood flow results in the inability of the heart to receive enough oxygen to function optimally. Risk factors for CAD are high blood pressure, family history of CAD, diabetes, smoking, being post-menopausal, and being older than 45 for men. Additional risk factors are high low-density lipoproteins (LDLs) and low high-density lipoproteins (HDLs). Being able to diagnose and treat CAD before a catastrophic event, like a heart attack, is important.
- CT angiography is considered a noninvasive anatomic test. There are many ways to diagnose CAD, including exercise-based tests, cardiac nuclear imaging with single-photon emission computed tomography (SPECT) or positron emission tomography (PET), pharmacologic stress magnetic resonance imaging (MRI), computed tomography (CT), coronary angiography, and Doppler ultrasound-derived flow reserve measurements.³
- While the comparative effectiveness of CT angiography for the diagnosis of CAD has been unclear in the past, our search identified two AHRQ systematic reviews, one archived 2012 review⁴ and one 2016 review,¹ which directly addresses the efficacy of CTA when compared to other diagnostic tools.
 - An archived 2012 AHRQ review, *Noninvasive Technologies for the Diagnosis of Coronary Artery Disease in Women*, included an examination of CTA in the diagnosis of CAD in women. While this review may be of interest to the nominator, it does not fully cover the population of interest.⁴
 - A 2016 AHRQ review, *Noninvasive Testing for Coronary Artery Disease*, compared several types of noninvasive tests for patients at risk for CAD. The review concluded that limited evidence from RCTs found no clear differences between CTA and other strategies in clinical outcomes across risk groups.¹

References

1. Skelly AC, Hashimoto R, Buckley DI, Brodt ED, Noelck N, Totten AM, Lindner JR, Fu R, McDonagh M. Noninvasive Testing for Coronary Artery Disease. Comparative Effectiveness Review No. 171. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2012-00014-I.) AHRQ Publication No. 16-EHC011-EF. Rockville, MD: Agency for Healthcare Research and Quality; March 2016. <https://www.effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=2204>
2. Medline Plus. 2016. Coronary Artery Disease. National Institutes of Health. Accessed: March 22, 2017. Available from: <https://medlineplus.gov/coronaryarterydisese.html>
3. Wolk MJ, Bailey SR, Doherty JU, et al. 2014. ACCF/AHA/ASE/ASNC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2013 multimodality appropriate use criteria for the detection and risk assessment of stable ischemic heart disease: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography,

Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. Journal of the American College of Cardiology. 63(4):380-406.

4. Dolor RJ, Melloni C, Chatterjee R, et al. AHRQ Comparative Effectiveness Reviews. Treatment Strategies for Women With Coronary Artery Disease. Rockville (MD): Agency for Healthcare Research and Quality (US); 2012. Available from: <https://www.effectivehealthcare.ahrq.gov/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=1227>