

ACR Appropriateness Criteria[®] Imaging for Transcatheter Aortic Valve Replacement

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Abstract

Aortic stenosis is a common valvular condition with increasing prevalence in aging populations. When severe and symptomatic, the downstream prognosis is poor without surgical or transcatheter aortic valve replacement. Transcatheter aortic valve replacement is now considered a viable alternative to surgical aortic valve replacement in patients considered high and intermediate risk for surgery. Pre-intervention imaging with echocardiography and CT are essential for procedure planning and device selection to help optimize clinical outcomes with MR angiography playing largely a complementary role. Modern 3-D cross-sectional imaging has consistently shown to help reduce procedural complications from vascular access injury to paravalvular regurgitation and coronary obstruction.

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Dr. Blanke reports personal fees from Edwards Lifesciences, personal fees from Tendyne, personal fees from Circle Cardiovascular Imaging, and personal fees from Neovasc, outside the submitted work. Dr. Gornik reports that she has a patent non invasive diagnostics/ABI measurement pending, is a Member of the Board of Directors of Intersocietal Accreditation Commission–Vascular Testing Division, and has received research funding for site research from Astra Zeneca. The other authors have no conflicts of interest related to the material discussed in this article.

Disclaimer: The ACR Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the FDA have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

The American College of Radiology Appropriateness Criteria are evidence-based guidelines for specific clinical conditions that are reviewed annually by a multidisciplinary expert panel. The guideline development and revision include an extensive analysis of current medical literature from peer reviewed journals and the application of well-established methodologies (RAND/UCLA Appropriateness Method and Grading of Recommendations Assessment, Development, and Evaluation or GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios. In those instances where evidence is lacking or equivocal, expert opinion may supplement the available evidence to recommend imaging or treatment.

Key Words: Aortic stenosis, Appropriateness Criteria, Appropriateness Use Criteria, AUC, Coronary obstruction, Paravalvular regurgitation, TAVR, Transcatheter heart valve

J Am Coll Radiol 2017;14:S449-S455. Copyright © 2017 American College of Radiology

ACR Appropriateness Criteria® Imaging for Transcatheter Aortic Valve Replacement. [Variants 1](#) and [2](#) and [Tables 1](#) and [2](#).

Variant 1. Pre-intervention planning for transcatheter aortic valve replacement at the aortic valve plane.

Procedure	Appropriateness Category	RRL
CTA chest with IV contrast	Usually Appropriate	☼☼☼
US echocardiography transesophageal	May Be Appropriate	○
MRA chest without IV contrast	May Be Appropriate	○
MRA chest without and with IV contrast	May Be Appropriate	○
CT chest without IV contrast	May Be Appropriate	☼☼☼
CT chest with IV contrast	Usually Not Appropriate	☼☼☼
Aortography thoracic	Usually Not Appropriate	☼☼☼
CT chest without and with IV contrast	Usually Not Appropriate	☼☼☼

Note: CTA = CT angiography; IV = intravenous; MRA = MR angiography; RRL = relative radiation level; US = ultrasound.

Variant 2. Pre-intervention planning for transcatheter aortic valve replacement in the supra- and infravalvular aorta and iliofemoral system.

Procedure	Appropriateness Category	RRL
CTA abdomen and pelvis with IV contrast	Usually Appropriate	☼☼☼☼☼
MRA abdomen and pelvis without and with IV contrast	May Be Appropriate	○
MRA abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without IV contrast	May Be Appropriate	☼☼☼☼
Aortography abdomen and pelvis	May Be Appropriate	☼☼☼☼
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☼☼☼☼
US intravascular aorta and iliofemoral system	Usually Not Appropriate	○
CT abdomen and pelvis with IV contrast	Usually Not Appropriate	☼☼☼☼

Note: CTA = CT angiography; IV = intravenous; MRA = MR angiography; RRL = relative radiation level; US = ultrasound.

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