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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The American College of Radiology seeks and encourages collaboration with other organizations on the development of the ACR Appropriateness Criteria through society representation on expert panels. Participation by representatives from collaborating societies on the expert panel does not necessarily imply individual or society endorsement of the final document. Reprint requests to: publications@acr.org

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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

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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 supravalvular 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.