American College of Radiology
ACR Appropriateness Criteria®

Preprocedural Planning for Transcatheter Aortic Valve Replacement

Variant 1: Preintervention planning for transcatheter aortic valve replacement: assessment of aortic root. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT heart function and morphology with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	9	9	0	0	0	0	0	1	0	1	14

References	Study Quality
44 (34658340)	2
43 (26164109)	2
42 (32306158)	3
41 (25147034)	3
40 (30017282)	3
24 (23954337)	3
22 (24947721)	3
15 (23684679)	2
39 (26239964)	4

MRI heart function and morphology without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	2	4	8	2	0

References	Study Quality
52 (32536342)	Good
51 (28570260)	1
50 (26395021)	1
49 (32318849)	1
48 (29736853)	1

MRI heart function and morphology without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	3	2	3	6	1

References	Study Quality
52 (32536342)	Good
51 (28570260)	1
50 (26395021)	1
49 (32318849)	1
48 (29736853)	1

US echocardiography transesophageal	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	5	1	10	1	0

References	Study Quality
53 (29625649)	2
54 (26320167)	2
55 (31549579)	Good

MRA chest with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	3	5	9	0	0	0

References	Study Quality
45 (31489471)	4

CTA chest with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	1	1	2	10	2	0	0	1
CTA coronary arteries with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	0	0	10	5	1	0	1
MRA chest without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	3	10	4	0	0	0

References	Study Quality
46 (26219296)	1
47 (26911969)	4

CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	4	2	0	1	1	1	0	0

CT chest without IV contrast	Usually not appropriate	Moderate	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	1	2	3	1	1	0	0	0
	References		Study Quality												
	38 (26784328)		2												
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	3	3	0	1	1	0	1	0
MRA coronary arteries without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	8	5	3	0	0	0	0	0	1
MRA coronary arteries without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	8	4	4	0	0	1	0	0	0
US echocardiography transthoracic resting	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	4	2	1	2	1	1	0	0
Aortography chest	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	3	0	0	0	0	0	0	0

Variant 2: Preintervention planning for transcatheter aortic valve replacement: assessment of supravalvular aorta and vascular access. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTA chest abdomen pelvis with IV contrast	Usually appropriate	Limited	☢☢☢☢☢ 30-100 mSv		9	9	0	0	0	0	0	0	0	2	14
	References		Study Quality												
	23 (25552490)		3												
	60 (29130612)		3												
	59 (33432599)		3												
	58 (28063810)		4												
CTA abdomen and pelvis with IV contrast	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv		8	8	0	0	0	0	0	1	5	8	3
	References		Study Quality												

		57 (31732445)		3												
CTA chest with IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	0	0	0	8	5	4	
		References		Study Quality												
		60 (29130612)		3												
		61 (29100645)		3												
		49 (32318849)		1												
MRA abdomen and pelvis without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	4	8	3	1	0	
		References		Study Quality												
		48 (29736853)		1												
MRA chest without and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	6	8	3	0	0	
MRA chest abdomen pelvis with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	6	8	1	2	0	
MRA abdomen and pelvis without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	2	9	4	2	0	0	
		References		Study Quality												
		49 (32318849)		1												
		62 (28549023)		1												
US intravascular aorta and iliofemoral system	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	0	3	2	3	6	3	0	0	0	
		References		Study Quality												
		63 (27922808)		1												
CT abdomen and pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	5	1	3	3	2	1	0	1	0	
CT abdomen and pelvis without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	4	3	3	5	0	1	0	0	0	
		References		Study Quality												

		23 (25552490)			3										
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	3	3	7	0	2	3	3	0	0	1	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	7	1	1	3	4	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	6	2	3	4	0	1	0	0	0
		References			Study Quality										
		56 (23195040)			3										
CT chest abdomen pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	3	2	4	3	2	1	1	0	0
US duplex Doppler chest abdomen pelvis	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	6	2	4	2	1	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	2	0	2	3	1	0	1	0
CT chest abdomen pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	3	3	2	1	0	1	0	0
CT chest abdomen pelvis without and with IV contrast	Usually not appropriate	Moderate	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	7	4	3	1	1	0	1	0	0
		References			Study Quality										
		38 (26784328)			2										
CT heart function and morphology with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	2	6	0	0	1	0	0	0
US echocardiography transthoracic resting	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	2	0	0	0	0	0	0	0

US echocardiography transesophageal	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	0	5	0	0	0	0	2	0
Aortography chest abdomen pelvis	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		1	1	11	3	2	0	1	0	0	0	0

Appendix Key

A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

Appropriateness Category: The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

SOE: Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References:** The citation number and PMID for the reference(s) associated with the recommendation.
- **Study Quality**: The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

RRL: Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

Rating: The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Median: The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Final tabulations: A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at **www.acr.org/ac.**