American College of Radiology
ACR Appropriateness Criteria®

Assessment of Cardiac Function and Baseline Cardiac Risk Stratification in Oncology Patients

Variant 1: Adult. Cardiac risk stratification prior to initiation of oncologic therapy. No cardiac symptoms. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US echocardiography transthoracic resting	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	4	4	11
References				Study Quality											
26 (27068546)				2											
1 (32809231)				4											
2 (32463967)				4											
25 (16012124)				3											
MRI heart function and morphology without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	1	5	8	3	2
References				Study Quality											
16 (27918725)				4											
MRI heart function and morphology without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	0	3	10	3	3
References				Study Quality											
15 (20513610)				4											
16 (27918725)				4											
Nuclear medicine ventriculography	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	0	1	2	3	10	2	1
References				Study Quality											
22 (22154116)				3											

References	Study Quality
23 (28335788)	3
21 (32748278)	3
20 (3605130)	2

CT coronary calcium	May be appropriate	Limited	☢☢☢ 1-10 mSv		5	5	0	0	1	8	4	4	1	0	1

References	Study Quality
14 (28342038)	2
12 (35441347)	4
10 (30894318)	4
11 (31784032)	4
13 (31272536)	4

MRI heart function with stress without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	6	4	7	1	0	0

References	Study Quality
16 (27918725)	4

US echocardiography transthoracic stress	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	8	4	4	2	0	0

References	Study Quality
1 (32809231)	4
2 (32463967)	4

CTA coronary arteries with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	1	3	6	4	4	1	0	0
CT heart function and morphology with IV contrast	May be appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	0	1	10	3	3	2	0	0
MRI heart function with stress without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	4	4	0	0	5	9	3	2	0	0	0
US echocardiography transesophageal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	4	4	1	1	5	9	2	1	0	0	0

References	Study Quality
1 (32809231)	4

		2 (32463967)			4											
Rb-82 PET/CT MPI rest and stress	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		4	4	0	0	1	11	3	4	0	0	0
		References			Study Quality											
		19 (34820770)			3											
SPECT or SPECT/CT heart	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		4	4	0	0	1	12	3	3	0	0	0
		References			Study Quality											
		24 (26072421)			2											
N-13 ammonia PET/CT MPI rest and stress	May be appropriate	Limited	☢☢☢ 1-10 mSv		4	4	0	1	3	10	2	3	0	0	0
		References			Study Quality											
		18 (31741325)			3											
		17 (32919154)			3											
		19 (34820770)			3											
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	3	3	5	3	4	2	3	0	1	0	0
PYP scan heart	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		3	3	6	1	8	1	1	0	0	1	0
		References			Study Quality											
		2 (32463967)			4											
PYP scan with SPECT or SPECT/CT heart	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		3	3	6	2	7	1	1	0	0	1	0
		References			Study Quality											
		2 (32463967)			4											
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	5	3	1	1	0	0	0	0
CT chest with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	5	3	0	2	1	0	0	0

		References					Study Quality									
		9 (36216699)					4									
CT chest without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	3	3	2	1	0	1	0	0
		References					Study Quality									
		9 (36216699)					4									
CT chest without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	4	3	1	2	0	1	0	0
		References					Study Quality									
		9 (36216699)					4									
CTA pulmonary arteries with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	9	3	5	1	0	0	0	0	0
CTA chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	8	5	4	0	1	0	0	0	0
Arteriography coronary	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	12	3	2	0	1	0	0	0	0
Arteriography coronary with ventriculography	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	2	5	0	0	0	0	0	0
US duplex Doppler lower extremity	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	0	3	2	0	0	0	0	0

Variant 2: Adult. Assessment of cardiac function during oncologic therapy. Cardiac symptoms. Ischemia not excluded. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US echocardiography transthoracic resting	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	1	2	3	13
		References					Study Quality								
		43 (27296561)					3								

44 (29984789)	2
41 (30092972)	4
38 (26530752)	2
45 (30414755)	2
42 (22744937)	2
39 (23847385)	4
1 (32809231)	4
40 (12534739)	3

CTA coronary arteries with IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	1	0	0	0	6	7	5

References	Study Quality
29 (33555007)	4
9 (36216699)	4

MRI heart function and morphology without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	1	3	6	9

References	Study Quality
30 (27183525)	4
32 (33404058)	4
37 (28395671)	2
33 (33606757)	3
31 (33029698)	4
34 (34536111)	2
35 (35718419)	4
36 (35730658)	4

MRI heart function and morphology without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	0	4	9	4	2

References	Study Quality
30 (27183525)	4
32 (33404058)	4
37 (28395671)	2

MRI heart function with stress without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	0	2	9	5	3
US echocardiography transthoracic stress	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	1	1	0	1	1	7	2	5
Rb-82 PET/CT MPI rest and stress	Usually appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		7	7	0	0	1	0	2	2	8	5	1
SPECT or SPECT/CT heart	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv		7	7	0	0	1	1	3	2	6	5	1

Nuclear medicine ventriculography	May be appropriate	Moderate	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	1	2	4	6	6	0	0

References	Study Quality
23 (28335788)	3
20 (3605130)	2

CT heart function and morphology with IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	1	5	4	5	4	0	0

References	Study Quality
29 (33555007)	4
9 (36216699)	4

Arteriography coronary	May be appropriate	Limited	☢☢☢ 1-10 mSv		5	5	0	0	0	5	7	6	1	0	0

References	Study Quality
27 (30611123)	3
28 (32236322)	3

Arteriography coronary with ventriculography	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	0	7	5	6	1	0	0
MRI heart function with stress without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	2	1	1	10	4	0

References	Study Quality
30 (27183525)	4
32 (33404058)	4
33 (33606757)	3
31 (33029698)	4
34 (34536111)	2
35 (35718419)	4
36 (35730658)	4

US echocardiography transesophageal	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	6	7	4	1	0	0

References	Study Quality
43 (27296561)	3
44 (29984789)	2
41 (30092972)	4
38 (26530752)	2
45 (30414755)	2
42 (22744937)	2
39 (23847385)	4
1 (32809231)	4
40 (12534739)	3

Radiography chest	May be appropriate (Disagreement)	Expert Opinion	☢ <0.1 mSv	☢ <0.03 mSv [ped]	5	5	2	1	0	1	0	3	8	3	1
CTA pulmonary arteries with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv		5	5	0	2	0	6	4	6	0	1	0
N-13 ammonia PET/CT MPI rest and stress	May be appropriate (Disagreement)	Expert Opinion	☢☢☢ 1-10 mSv		5	5	0	1	0	2	1	3	6	5	1
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	3	5	9	2	0	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	6	3	1	4	2	0	2	0	0
CT coronary calcium	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	7	7	5	0	0	0	0	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	5	8	1	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	6	6	0	0	0	0	0	0
US duplex Doppler lower extremity	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	9	4	4	1	1	0	0	0	0

CTA chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	4	8	7	0	0	0	0	0	0
PYP scan heart	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	8	3	5	0	2	0	0	0	0
PYP scan with SPECT or SPECT/CT heart	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	7	3	5	0	2	1	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.**