American College of Radiology
ACR Appropriateness Criteria®

Syncope

Variant 1: Presyncope or syncope. Clinical suspicion for cardiovascular etiology based on history, physical examination, and ECG findings. 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]	7	7	1	0	0	0	3	2	7	2	7

References	Study Quality
68 (27838041)	3
3 (28286222)	4
8 (29562304)	4
69 (26881172)	3
67 (12231593)	3

CTA chest with IV contrast	May be appropriate	Moderate	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	1	0	3	14	1	2	0	0

References	Study Quality
43 (27797317)	3
46 (12427495)	3
47 (8350637)	4
45 (29655808)	4
44 (31395124)	2

Radiography chest	May be appropriate	Moderate	☢ <0.1 mSv	☢ <0.03 mSv [ped]	5	5	0	0	2	2	14	3	0	0	0

References	Study Quality
62 (27833675)	3

		61 (30054114)		2												
CTA coronary arteries with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	0	0	13	6	1	1	0	0
		References		Study Quality												
		48 (28321775)		2												
		50 (3338301)		4												
		49 (10807452)		4												
MRI heart function and morphology without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	3	2	4	6	5	2	0	0	0
		References		Study Quality												
		53 (24450522)		4												
		52 (19307481)		4												
		51 (20667520)		3												
		55 (11123385)		4												
		57 (11933919)		3												
		56 (22185868)		4												
		58 (18036445)		4												
		59 (15358027)		1												
		60 (22835669)		3												
		54 (30354431)		4												
MRI heart function and morphology without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	3	0	1	10	5	2	0	0	0
		References		Study Quality												
		53 (24450522)		4												
		52 (19307481)		4												
		51 (20667520)		3												
		55 (11123385)		4												
		57 (11933919)		3												
		56 (22185868)		4												
		58 (18036445)		4												

References	Study Quality
59 (15358027)	1
60 (22835669)	3
54 (30354431)	4

CT heart function and morphology with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	7	4	3	3	3	1	1	0	0
US echocardiography transesophageal	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	10	1	6	2	1	1	0	0	1
CT head with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	11	5	1	2	1	0	2	0	0

References	Study Quality
15 (25763568)	1
19 (25539233)	3
18 (17551685)	3
17 (17111790)	4
16 (16292675)	4

US echocardiography transthoracic stress	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	9	3	4	4	1	0	0	0	0

References	Study Quality
70 (15894976)	3
71 (28501918)	4

SPECT or SPECT/CT MPI rest and stress	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	11	5	3	1	0	0	1	1	0

References	Study Quality
63 (23418293)	3

CT head without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	14	5	2	0	0	0	0	0	0

References	Study Quality
15 (25763568)	1
19 (25539233)	3

		18 (17551685)		3											
		17 (17111790)		4											
		16 (16292675)		4											
CT head without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	14	7	0	0	0	0	0	0	0
		References		Study Quality											
		15 (25763568)		1											
		19 (25539233)		3											
		18 (17551685)		3											
		17 (17111790)		4											
		16 (16292675)		4											
MRI head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	2	0	3	1	0	1	1	0
MRI head without and with IV contrast	Usually not appropriate	Expert Opinion	O 0 mSv	O 0 mSv [ped]	1	1	19	2	0	0	0	0	0	0	0
US duplex Doppler carotid artery	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	12	8	1	0	0	0	0	0	0
		References		Study Quality											
		66 (25669837)		3											
		64 (25122665)		4											
		20 (19636031)		4											
		65 (15819284)		3											
SPECT or SPECT/CT MPI stress only	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	4	3	0	0	1	0	0	0
SPECT or SPECT/CT MPI rest only	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	15	3	3	0	1	0	0	0	0

Variant 2: Presyncope or syncope. Low probability of cardiovascular etiology based on history, physical examination, and ECG findings. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography chest	May be appropriate	Moderate	☢ <0.1 mSv	☢ <0.03 mSv [ped]	4	4	1	0	3	7	10	0	0	0	0

References	Study Quality
62 (27833675)	3
61 (30054114)	2

CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	5	2	2	0	1	0	0	0
CTA coronary arteries with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	14	3	4	0	1	0	0	0	0
CT heart function and morphology with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	14	4	3	0	1	0	0	0	0
CT head with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	5	2	0	0	1	1	0	0

References	Study Quality
15 (25763568)	1
19 (25539233)	3
18 (17551685)	3
17 (17111790)	4
16 (16292675)	4

CT head without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	18	3	0	0	0	0	0	0	0

References	Study Quality
15 (25763568)	1
19 (25539233)	3
18 (17551685)	3
17 (17111790)	4
16 (16292675)	4

CT head without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	5	2	0	0	1	1	0	0

References	Study Quality
15 (25763568)	1
19 (25539233)	3
18 (17551685)	3
17 (17111790)	4
16 (16292675)	4

MRI heart function and morphology without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	4	4	1	0	0	0	0	0
MRI heart function and morphology without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	3	4	1	0	0	0	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	5	1	0	0	1	0	1	0
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	4	2	0	0	1	0	0	1
US duplex Doppler carotid artery	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	18	3	0	0	0	0	0	0	0

References	Study Quality
66 (25669837)	3
64 (25122665)	4
20 (19636031)	4
65 (15819284)	3

US echocardiography transthoracic resting	Usually not appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	1	1	14	4	3	0	0	0	0	0	0

References	Study Quality
72 (29073313)	4
66 (25669837)	3
69 (26881172)	3
73 (30255862)	2

US echocardiography transthoracic stress	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	4	3	1	0	0	0	0	0
US echocardiography transesophageal	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	4	2	0	0	0	0	0	0
SPECT or SPECT/CT MPI stress only	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	15	4	3	0	0	0	0	0	0
SPECT or SPECT/CT MPI rest and stress	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	15	4	2	1	0	0	0	0	0
		References		Study Quality												
		63 (23418293)		3												
SPECT or SPECT/CT MPI rest only	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	16	4	2	0	0	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.**