

**American College of Radiology
ACR Appropriateness Criteria®**

Diagnosis and Monitoring of Sarcopenia

Variant 1: Adult 60 years of age and older with suspected sarcopenia. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
DXA total body composition	Usually appropriate	Limited	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	9	9	0	0	0	0	0	0	3	2	6
CT abdomen without IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	1	0	0	3	5	1	1	0	0
		References		Study Quality											
		124 (32841333)		2											
		54 (37191484)		3											
		53 (36165792)		3											
CT chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	2	0	0	4	3	1	1	0	0
		References		Study Quality											
		60 (35178898)		3											
US thigh	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	1	3	3	2	2	0	0
		References		Study Quality											
		42 (39258324)		2											
		43 (35810572)		4											
		41 (34881516)		3											

FDG-PET/CT whole body	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	2	3	1	2	2	1	0	0	0
		References			Study Quality										
		71 (40159388)			3										
MRI abdomen without IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	2	2	2	4	0	2	2	0	1	0	0
MRI abdomen without and with IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	2	2	4	2	1	1	2	1	0	0	0
		References			Study Quality										
		67 (35542962)			3										
		66 (32816394)			2										
		64 (36925319)			3										
		65 (37686870)			3										
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	2	4	0	3	1	0	1	0	0
Bone scan whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	10	1	0	0	0	0	0	0	0
Radiography chest	Usually not appropriate	Limited	☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	8	2	1	0	0	0	0	0	0
		References			Study Quality										
		63 (36457204)			3										
FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	6	3	0	0	1	0	0	1	0

Variant 2: Adult with cancer and suspected sarcopenia. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
DXA total body composition	Usually	Limited	☼ <0.1 mSv	☼ <0.03	9	9	0	0	0	0	0	0	2	3	5

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations												
							1	2	3	4	5	6	7	8	9				
	appropriate			mSv [ped]															
CT abdomen without IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	1	0	0	3	5	1	1	0	0				
		References		Study Quality															
		122 (37444508)		3															
CT chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	2	0	0	4	3	1	1	0	0				
		References		Study Quality															
		61 (32504466)		3															
		87 (39912982)		3															
US thigh	May be appropriate	Moderate	○ ○ mSv	○ ○ mSv [ped]	5	5	0	0	1	2	4	2	1	0	0				
		References		Study Quality															
		75 (38473418)		4															
		77 (39467778)		4															
CT abdomen with IV contrast	May be appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	2	0	0	5	3	0	1	0	0				
		References		Study Quality															
		122 (37444508)		3															
		80 (38558541)		Good															
		79 (36000663)		4															
		78 (34893457)		4															
		82 (40002202)		Good															
CT abdomen without and with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕⊕ 10-30 mSv [ped]	4	4	2	0	1	4	3	0	1	0	0				

		References	Study Quality												
		122 (37444508)	3												
CT chest with IV contrast	May be appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	2	0	0	7	1	0	1	0	0
		References	Study Quality												
		85 (39475952)	3												
		86 (39932411)	3												
		59 (37732694)	3												
		84 (37891259)	2												
CT chest without and with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	2	0	2	6	1	0	0	0	0
MRI abdomen without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	2	3	1	2	1	0	1	0	0
MRI abdomen without and with IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	3	3	3	2	2	1	1	0	1	0	0
		References	Study Quality												
		91 (40195140)	Good												
		88 (34089074)	2												
		90 (39001378)	4												
		89 (38900325)	4												
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	2	3	1	2	1	0	1	0	0
MRI chest without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	3	3	3	2	2	1	1	0	1	0	0
		References	Study Quality												
		92 (30088069)	4												
FDG-PET/CT whole body	Usually not appropriate	Moderate	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	3	3	3	2	2	0	2	0	1	0	0
		References	Study Quality												

95 (32888349)	4
96 (38086801)	4
93 (31823231)	3
94 (39543534)	3
97 (36781423)	4
98 (36480105)	2

FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	5	4	0	0	0	1	0	0	0
Bone scan whole body	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☹ <0.1 mSv	☹ <0.03 mSv [ped]	1	1	8	1	1	0	0	0	0	0	0

Variant 3: Adult with cachexia or malnutrition and suspected sarcopenia. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
DXA total body composition	Usually appropriate	Limited	☹ <0.1 mSv	☹ <0.03 mSv [ped]	9	9	0	0	0	0	0	0	3	2	5
CT abdomen without IV contrast	May be appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	5	0	0	0	4	5	1	1	0	0
CT chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	5	2	0	0	4	3	1	1	0	0
US thigh	May be appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	5	5	0	0	1	4	2	2	0	1	0
CT abdomen with IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	4	4	1	0	0	6	3	0	1	0	0

CT abdomen without and with IV contrast	May be appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	4	4	1	0	1	5	3	0	1	0	0	
CT chest with IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	2	0	0	7	1	0	1	0	0	
		References			Study Quality											
		59 (37732694)			3											
CT chest without and with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	4	4	2	0	2	6	1	0	0	0	0	
MRI abdomen without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	2	2	2	2	1	0	1	0	0	
MRI abdomen without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	1	3	1	1	1	0	0	0	
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	1	2	2	1	0	1	0	0	
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	1	3	1	1	1	0	0	0	
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	2	2	2	1	3	0	0	0	0	
FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	5	2	2	0	1	0	0	0	0	
Bone scan whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0	
Radiography chest	Usually not appropriate	Expert Consensus	☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	8	1	1	0	0	0	0	0	0	

Variant 4: Adult with frailty or multiple comorbidities and suspected sarcopenia. Initial imaging.

Radiography chest	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	1	1	8	1	1	0	0	0	0	0	0
FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	6	3	0	0	1	0	0	0	0

Variant 5: Adult with known sarcopenia. Surveillance.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
DXA total body composition	Usually appropriate	Limited	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	8	8	0	0	0	0	0	3	2	2	3
		References		Study Quality											
		140 (35122089)		4											
		136 (30454952)		4											
		134 (31296891)		4											
		135 (35187867)		2											
		137 (24200863)		4											
CT abdomen without IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	0	0	4	5	1	1	0	0
		References		Study Quality											
		153 (29364725)		2											
CT chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	2	0	0	4	3	1	1	0	0
		References		Study Quality											
		156 (34785234)		3											
		158 (36223552)		4											
US thigh	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	0	3	4	2	0	1	0

			References	Study Quality														
			142 (36227022)	4														
			144 (33341024)	4														
			143 (38267149)	3														
			145 (35196746)	4														
CT abdomen with IV contrast	May be appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	1	0	0	6	3	0	1	0	0			
			References	Study Quality														
			148 (31222643)	4														
			149 (31850687)	4														
			146 (33806224)	4														
			151 (34196134)	3														
CT abdomen without and with IV contrast	May be appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	4	4	1	0	1	5	3	0	1	0	0			
			References	Study Quality														
			159 (38873566)	4														
CT chest with IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	2	0	0	7	1	0	1	0	0			
			References	Study Quality														
			155 (33829665)	3														
CT chest without and with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	4	4	2	0	2	6	1	0	0	0	0			
FDG-PET/CT whole body	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	2	0	6	2	1	0	0	0	0			
			References	Study Quality														
			162 (39375403)	2														
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	2	2	5	2	1	1	0	0	1	0	0			

MRI abdomen without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	6	1	1	1	0	0	1	0	0
MRI abdomen without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	6	1	2	0	0	1	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	6	1	2	0	0	1	0	0	0
Bone scan whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	8	1	1	0	0	0	0	0	0
FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	6	2	1	0	0	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.