

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

**Thyroid Disease**

**Variant 1: Palpable thyroid nodule. Not goiter. Euthyroid. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
US thyroid	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	0	0	0	0	16
		References	Study Quality													
		8 (28372962)	4													
		16 (26462967)	4													
CT neck with IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	4	4	4	0	3	3	5	1	0	0	0	
		References	Study Quality													
		7 (25456025)	4													
CT neck without IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	4	4	4	2	2	7	1	0	0	0	0	
		References	Study Quality													
		7 (25456025)	4													
MRI neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	7	1	2	3	2	1	1	0	0	
MRI neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	4	1	7	2	2	0	0	0	0	
I-123 radionuclide uptake and scan neck	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		2	2	7	5	3	0	2	0	0	0	0	

I-131 radionuclide uptake and Tc-99m pertechnetate scan neck	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv		2	2	6	6	4	0	1	0	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	11	1	2	1	1	0	1	0	0
		References		Study Quality											
		7 (25456025)		4											
FDG-PET/CT neck	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	13	3	0	0	0	0	1	0	0

**Variant 2: Suspected goiter. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
US thyroid	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	0	0	0	0	16
		References		Study Quality												
		8 (28372962)		4												
		16 (26462967)		4												
CT neck without IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	7	7	1	0	0	1	3	2	6	1	3	
		References		Study Quality												
		17 (24295043)		4												
CT neck with IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	5	5	0	1	0	2	8	2	1	2	0	
		References		Study Quality												
		17 (24295043)		4												
I-123 radionuclide uptake and scan neck	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv		5	5	2	2	1	3	8	0	0	0	0	
		References		Study Quality												



			24 (22440986)		4													
I-123 radionuclide uptake and scan neck	Usually appropriate	Limited	☹☹☹ 1-10 mSv		8	8	1	0	0	0	2	0	1	6	7			
			References		Study Quality													
			19 (27521067)		4													
			25 (26926973)		4													
			26 (21825836)		4													
			16 (26462967)		4													
I-131 radionuclide uptake and Tc-99m pertechnetate scan neck	Usually appropriate	Limited	☹☹☹☹ 10-30 mSv		7	7	0	1	0	0	2	2	6	3	3			
			References		Study Quality													
			19 (27521067)		4													
			25 (26926973)		4													
			26 (21825836)		4													
			16 (26462967)		4													
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	8	8	0	0	0	0	0	0	0			
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	7	2	0	3	3	1	1	0	0			
MRI neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	8	1	3	3	1	0	0	0	1			
MRI neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	8	2	2	1	3	0	0	0	1			
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	2	1	1	1	0	0	0	1			
FDG-PET/CT neck	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	1	0	0	0	0	0	0	1			

**Variant 4: Primary hypothyroidism. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	14	0	1	0	0	0	2	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	13	1	0	1	1	0	0	1	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	14	0	0	1	1	0	0	0	1
MRI neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	14	1	1	0	0	0	0	0	1
MRI neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	14	0	2	0	0	0	0	0	1
FDG-PET/CT neck	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	16	0	0	0	0	0	0	0	1
I-123 radionuclide uptake and scan neck	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	16	0	0	0	1	0	0	0	0
I-131 radionuclide uptake and Tc-99m pertechnetate scan neck	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	16	0	0	0	1	0	0	0	0
US thyroid	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	0	0	1	0	0	1

**Variant 5: Preoperative evaluation of differentiated thyroid cancer.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US thyroid	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	9	9	0	1	0	0	0	0	2	3	11

References	Study Quality
28 (14668727)	2
29 (19696304)	2
31 (27007092)	2
30 (18358074)	2
32 (22863305)	2
33 (23554058)	2

CT neck with IV contrast	Usually appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	8	8	0	0	0	1	0	0	2	6	8
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References	Study Quality
16 (26462967)	4
30 (18358074)	2
33 (23554058)	2
32 (22863305)	2
34 (25188202)	4
11 (24295076)	4
12 (22827435)	3

MRI neck without and with IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	6	6	1	0	0	0	5	5	2	4	0
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CT neck without IV contrast	May be appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	5	0	0	0	8	8	0	0	0	0
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References	Study Quality
30 (18358074)	2
33 (23554058)	2
34 (25188202)	4
32 (22863305)	2
11 (24295076)	4
12 (22827435)	3

MRI neck without IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	4	4	1	0	1	12	2	0	0	0	0
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FDG-PET/CT whole body	Usually not appropriate	Strong	⊕⊕⊕⊕ 10-30 mSv		3	3	4	2	7	3	0	0	0	0	0
		References	Study Quality												
		35 (16918964)	1												
		36 (19158200)	1												
CT neck without and with IV contrast	Usually not appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	8	2	3	0	2	1	0	0	1
		References	Study Quality												
		30 (18358074)	2												
		33 (23554058)	2												
		32 (22863305)	2												
		34 (25188202)	4												
I-123 scan whole body	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		1	1	14	1	0	0	1	0	1	0	0
I-131 scan whole body	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv		1	1	14	1	0	0	0	1	1	0	0
In-111 somatostatin receptor scintigraphy whole body	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv		1	1	14	2	0	0	0	0	1	0	0

**Variant 6: Early imaging after treatment of differentiated thyroid cancer.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
US thyroid	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	0	0	0	16
		References	Study Quality													
		16 (26462967)	4													
I-123 scan whole body	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv		6	6	1	0	0	0	5	8	0	1	1	

		References	Study Quality												
		16 (26462967)	4												
CT neck with IV contrast	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	5	5	1	2	3	2	1	5	2	0	0
I-131 scan whole body	May be appropriate (Disagreement)	Expert Opinion	⊕⊕⊕⊕ 10-30 mSv		5	5	1	0	1	1	8	2	2	1	0
		References	Study Quality												
		16 (26462967)	4												
MRI neck without and with IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	4	4	3	1	3	2	7	0	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	3	3	3	4	3	6	0	0	0	0	
MRI neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	6	1	2	7	0	0	0	0	
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv		2	2	6	3	1	1	5	0	0	0	
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	14	1	1	0	0	0	0	0	
In-111 somatostatin receptor scintigraphy whole body	Usually not appropriate	Limited	⊕⊕⊕⊕ 10-30 mSv		1	1	16	0	0	0	0	0	0	0	
		References	Study Quality												
		16 (26462967)	4												

**Variant 7: Suspected recurrence of differentiated thyroid cancer.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT neck with IV contrast	Usually appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv	9	9	0	0	0	1	1	0	1	5	9









CT abdomen without and with IV contrast	May be appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	6	6	1	0	0	0	3	11	1	0	0
		References	Study Quality												
		54 (25810047)	4												
MRI abdomen without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	0	5	7	4	0	0
		References	Study Quality												
		53 (17726071)	1												
		55 (27682648)	4												
		56 (26494385)	4												
MRI complete spine without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	0	2	7	5	3	0
		References	Study Quality												
		53 (17726071)	1												
		57 (15572422)	4												
Tc-99m bone scan whole body	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	6	6	0	0	0	1	4	8	3	1	0
		References	Study Quality												
		16 (26462967)	4												
CT chest without IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	0	0	1	4	4	5	2	0	0
		References	Study Quality												
		53 (17726071)	1												
CT neck without IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	5	1	0	2	5	7	1	0	0	0
		References	Study Quality												
		52 (25368270)	3												
		54 (25810047)	4												

MRI abdomen without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	3	1	1	3	7	2	0	0	0	
		References	Study Quality													
		53 (17726071)	1													
		55 (27682648)	4													
		56 (26494385)	4													
MRI complete spine without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	0	0	0	3	10	3	0	0	0	
		References	Study Quality													
		53 (17726071)	1													
		57 (15572422)	4													
FDG-PET/CT whole body	May be appropriate	Strong	☼☼☼☼ 10-30 mSv		5	5	1	0	0	2	7	4	3	0	0	
		References	Study Quality													
		58 (22527889)	Good													
		59 (18375923)	1													
		60 (17401085)	2													
		61 (11801705)	3													
		62 (17892923)	4													
		63 (19156423)	4													
		64 (22223169)	2													
		65 (23081996)	3													
MRI neck without IV contrast	May be appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	4	4	1	0	0	9	3	3	0	0	0	
CT abdomen without IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	2	2	10	1	1	0	0	0	0	
		References	Study Quality													
		54 (25810047)	4													
CT chest without and with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	14	0	2	0	0	0	0	0	0	

		References	Study Quality													
		53 (17726071)	1													
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0	
I-123 scan whole body	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		1	1	11	3	2	0	0	0	1	0	0	
		References	Study Quality													
		61 (11801705)	3													
		62 (17892923)	4													
		66 (8683310)	4													
I-131 scan whole body	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv		1	1	11	2	3	0	0	0	0	1	0	
		References	Study Quality													
		61 (11801705)	3													
		62 (17892923)	4													
		66 (8683310)	4													
Ga-68 DOTATATE PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv		1	1	9	1	6	0	0	0	0	0	0	
		References	Study Quality													
		67 (25369749)	3													
		69 (28429044)	2													
In-111 somatostatin receptor scintigraphy whole body	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv		1	1	11	3	1	0	2	0	0	0	0	
		References	Study Quality													
		61 (11801705)	3													
		66 (8683310)	4													
		62 (17892923)	4													

## **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](http://www.acr.org/ac).