American College of Radiology
ACR Appropriateness Criteria®

Staging and Follow-up of Esophageal Cancer

Variant 1: Newly diagnosed esophageal cancer. Pretreatment clinical staging. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations 1	2	3	4	5	6	7	8	9
FDG-PET/CT skull base to mid-thigh	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	1	0	0	2	0	4	5	6

References	Study Quality
2 (29179897)	4
13 (20379789)	2
10 (29153370)	2
8 (28363659)	2
17 (24389439)	2
16 (21964582)	2
14 (19379906)	2
18 (19184245)	2
11 (15181133)	2
15 (15365078)	Inadequate

CT chest and abdomen with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	1	0	1	0	3	4	2	5	2

References	Study Quality
10 (29153370)	2
8 (28363659)	2
12 (26008856)	2
7 (20033712)	2

		4 (6849089)		2												
		5 (1898802)		2												
		6 (18330935)		Good												
		9 (-3194704)		4												
		11 (15181133)		2												
CT chest abdomen pelvis with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	1	0	1	4	7	3	2	0	0
		References		Study Quality												
		12 (26008856)		2												
		11 (15181133)		2												
MRI chest and abdomen without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	0	0	1	13	4	0	0	0	0
		References		Study Quality												
		21 (28799124)		2												
		20 (27767330)		2												
		22 (26315570)		2												
FDG-PET/MRI skull base to mid-thigh	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	0	1	9	7	0	1	0	0
		References		Study Quality												
		19 (24868109)		2												
MRI chest and abdomen without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	6	3	5	1	1	2	0	0	0
		References		Study Quality												
		21 (28799124)		2												
		20 (27767330)		2												
		22 (26315570)		2												
CT chest abdomen pelvis without IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	5	3	0	1	0	1	0	0
		References		Study Quality												
		12 (26008856)		2												

		11 (15181133)		2												
CT chest abdomen pelvis without and with IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	9	5	2	1	0	1	0	0	0	
		References		Study Quality												
		12 (26008856)		2												
		11 (15181133)		2												
CT chest and abdomen without IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		2	2	6	5	1	2	2	0	1	1	0	
		References		Study Quality												
		10 (29153370)		2												
		8 (28363659)		2												
		12 (26008856)		2												
		7 (20033712)		2												
		4 (6849089)		2												
		5 (1898802)		2												
		6 (18330935)		Good												
		9 (-3194704)		4												
		11 (15181133)		2												
CT chest and abdomen without and with IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		2	2	8	3	2	3	0	1	0	1	0	
		References		Study Quality												
		10 (29153370)		2												
		8 (28363659)		2												
		12 (26008856)		2												
		7 (20033712)		2												
		4 (6849089)		2												
		5 (1898802)		2												
		6 (18330935)		Good												
		9 (-3194704)		4												
		11 (15181133)		2												

Fluoroscopy upper GI series	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	2	1	0	1	0	1	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	1	1	15	2	0	1	0	0	0	0	0

Variant 2: Esophageal cancer. Imaging during treatment.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
FDG-PET/CT skull base to mid-thigh	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	1	0	0	3	5	4	5	0

References	Study Quality
26 (30111193)	2
33 (29917073)	4
29 (19953708)	2
27 (29533721)	2
30 (25351460)	2
31 (23470576)	2
28 (21221582)	2
25 (16118165)	4
32 (21233607)	2

MRI chest and abdomen without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	0	2	0	10	6	0	0	0	0

References	Study Quality
35 (30091709)	2
36 (27838148)	2
37 (30673335)	2
34 (27296409)	2

FDG-PET/MRI skull base to mid-thigh	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	1	5	1	5	5	0	1	0	0
CT chest and abdomen with IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		3	3	2	6	4	4	1	1	0	0	0

References	Study Quality
24 (23645329)	2
23 (21944048)	2
25 (16118165)	4

CT chest abdomen pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	3	8	4	3	0	0	0	0	0
CT chest abdomen pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	9	6	1	0	0	1	1	0	0
CT chest abdomen pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	9	4	3	1	0	1	0	0	0
CT chest and abdomen without IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		2	2	5	9	3	0	1	0	0	0	0

References	Study Quality
24 (23645329)	2
23 (21944048)	2
25 (16118165)	4

CT chest and abdomen without and with IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		2	2	8	6	1	1	0	0	2	0	0

References	Study Quality
24 (23645329)	2
23 (21944048)	2
25 (16118165)	4

MRI chest and abdomen without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	2	2	5	5	5	1	0	1	0	0	1

References	Study Quality
35 (30091709)	2
36 (27838148)	2
37 (30673335)	2
34 (27296409)	2

Fluoroscopy upper GI series	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	2	2	0	0	0	1	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	1	1	16	2	0	0	0	0	0	0	0

Variant 3: Esophageal cancer. Posttreatment imaging. No suspected or known recurrence.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
FDG-PET/CT skull base to mid-thigh	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	0	1	2	0	7	6	2

References	Study Quality
41 (29125331)	2
42 (25952733)	4

CT chest and abdomen with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	1	0	0	0	2	5	3	5	2

References	Study Quality
40 (24649807)	4
39 (19023632)	2
38 (15286962)	2

CT chest abdomen pelvis with IV contrast	May be appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	1	0	0	5	3	1	7	1	0

CT chest abdomen pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	9	6	1	0	0	1	1	0	0
CT chest and abdomen without IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		2	2	4	11	2	1	0	0	0	0	0

References	Study Quality
40 (24649807)	4
39 (19023632)	2
38 (15286962)	2

CT chest and abdomen without and with IV contrast	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv		2	2	6	9	1	1	1	0	0	0	0

References	Study Quality
40 (24649807)	4
39 (19023632)	2
38 (15286962)	2

FDG-PET/MRI skull base to mid-thigh	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	9	5	2	0	1	1	0	0	0
CT chest abdomen pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	11	4	1	1	0	1	0	0	0
Fluoroscopy upper GI series	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	2	2	0	0	1	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	1	1	16	2	0	0	0	0	0	0	0
MRI chest and abdomen without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	4	3	0	0	0	0	0	1
MRI chest and abdomen without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	4	1	2	1	0	0	0	0

Variant 4: Esophageal cancer. Posttreatment imaging. Suspected or known recurrence.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
FDG-PET/CT skull base to mid-thigh	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	1	0	0	1	4	8	4
	References			Study Quality											
	42 (25952733)			4											
	43 (24435775)			2											
CT chest and abdomen with IV contrast	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv		7	7	1	0	1	0	2	0	7	6	1
	References			Study Quality											
	43 (24435775)			2											
CT chest abdomen pelvis with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	1	0	1	2	6	2	3	3	0
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	8	1	1	2	4	1	0	1	0
CT chest abdomen pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	5	3	0	0	1	1	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	9	3	3	1	1	0	0	0	1
CT chest and abdomen without IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		2	2	4	9	3	1	0	1	0	0	0
	References			Study Quality											
	43 (24435775)			2											
CT chest and abdomen without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		2	2	9	3	3	1	0	0	1	1	0
	References			Study Quality											
	43 (24435775)			2											

MRI chest and abdomen without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	9	3	4	2	0	0	0	0	0
MRI chest and abdomen without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	8	3	3	2	1	0	0	0	1
FDG-PET/MRI skull base to mid-thigh	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	4	6	3	3	1	1	0	0	0
CT chest abdomen pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	10	5	1	1	0	1	0	0	0
Fluoroscopy upper GI series	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	3	1	0	0	1	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	1	1	16	2	0	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.**