American College of Radiology ACR Appropriateness Criteria®

Penetrating Torso Trauma

Variant 1: Adult. Penetrating torso trauma, hypotensive. Initial imaging.

	Appropriateness	GOT		D 1 DD1	- ·	36.11			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography trauma series	Usually appropriate	Expert Consensus	��� 1-10 mSv		9	9	1	0	0	0	1	0	3	2	7
CTA chest abdomen pelvis with IV contrast	Usually appropriate	Limited	ኇኇኇኇ 30- 100 mSv	����� 10-30 mSv [ped]	7	7	0	1	0	0	2	2	2	4	2
		References		Study	Quality										
		29 (31903225)			4										
		28 (26802856)			4										
		27 (22824572)			4										
CT chest abdomen pelvis with IV contrast	Usually appropriate	Limited	≎≎≎≎ 10-30 mSv	���� 3- 10 mSv [ped]	7	7	0	1	0	0	3	0	3	3	3
		References		Study	Quality										
		25 (-3196632)			2										
		24 (29369452)			4										
CT chest abdomen pelvis without IV contrast	Usually not appropriate	Expert Consensus	���� 10-30 mSv	���� 3- 10 mSv [ped]	3	3	3	2	6	0	3	0	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	9	3	1	0	0	0	0	0	0

MRI chest abdomen pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0
MRI chest abdomen pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	0	1	0	0	0	0	0	0

Variant 2: Adult. Ballistic penetrating torso trauma, unknown trajectory, normotensive. Initial imaging.

	Appropri	iateness	GOT		D 1 DD1	- ·	3.5.31			F	inal	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT chest abdomen pelvis with IV contrast	Usua approp		Limited	���� 10-30 mSv	���� 3- 10 mSv [ped]	9	9	0	0	1	0	0	1	1	2	9
			References		Study	Quality										
			3 (34019436)			4										
			15 (31666333)			2										
			2 (26492022)			4										
			30 (30343384)			4			_		_			_		
Radiography trauma series	Usua approp		Expert Consensus	≎≎≎ 1-10 mSv		9	9	1	0	0	0	0	0	3	3	7
CTA chest abdomen pelvis with IV contrast	Usua approp		Limited	ଡଡ଼େଡଡ଼ 30- 100 mSv		8	8	0	0	0	0	0	0	6	2	5
			References		Study	Quality										
			29 (31903225)			4										
			33 (31283454)			4									_	
CT chest abdomen pelvis without and with IV contrast	May approp	be oriate	Limited	୫୫୫୫ 10-30 mSv	����� 10-30 mSv [ped]	4	4	4	2	1	1	4	1	1	0	0
			References		Study	Quality										
			31 (23480864)		·	4										

CT chest abdomen pelvis without IV contrast	Usually approp	Limited	���� 10- mSv	30	���� 3- 10 mSv [ped]	3	3	3	2	4	2	3	0	0	0	0
		References			Study	Quality										
		32 (26945375)				2		_								
MRI chest abdomen pelvis without and with IV contrast	Usually approp	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	9	3	2	0	0	0	0	0	0
MRI chest abdomen pelvis without IV contrast	Usually approp	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	10	3	1	0	0	0	0	0	0

Variant 3: Adult. Ballistic penetrating torso trauma, limited to chest, normotensive. Initial imaging.

	Appropriat	teness	COF		_ [D 1 DD1	- ·	3.5.31			F	inal '	Tabu	latio	ns		
Procedure	Categor		SOE	Adults RR	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CTA chest with IV contrast	Usually appropria		Limited	≎≎≎ 1-10 mSv)	���� 3- 10 mSv [ped]	9	9	0	0	0	0	0	0	3	3	7
			References			Study	Quality										
			38 (25384283)				4										
CT chest with IV contrast	Usually appropria		Strong	≎≎≎ 1-10 mSv	ס	���� 3- 10 mSv [ped]	9	9	0	0	1	0	0	1	1	3	8
			References			Study	Quality										
			40 (23471527)				2										
			39 (32467475)				2										
			38 (25384283)				4										
			37 (27324324)				3										
			28 (26802856)				4										
Radiography trauma series	Usually appropria		Strong	��� 1-10 mSv	ס		9	9	1	0	0	0	0	0	2	3	8
			References			Study	Quality										
			43 (23536101)				4										

			42 (34607700)			2										
			41 (33441251)			2										
CT abdomen and pelvis with IV contrast	May approp (Disagre	riate	Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	1	0	1	0	7	2	1	1	0
CTA abdomen and pelvis with IV contrast	May approp (Disagre	riate	Expert Opinion	���� 10-30 mSv	0	5	5	1	0	0	3	2	1	2	3	1
			References		Study	Quality										
			29 (31903225)			4										
CT chest without IV contrast	May approp		Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	4	4	3	2	2	2	4	1	0	0	0
			References		Study	Quality										
			36 (35945464)			4										
CT chest without and with IV contrast	Usually approp		Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	3	3	6	1	1	3	1	1	1	0	0
CT abdomen and pelvis without IV contrast	Usually approp		Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	2	2	6	2	3	2	1	0	0	0	0
			References		Study	Quality		<u>.</u>								
			36 (35945464)			4										
CT abdomen and pelvis without and with IV contrast	Usually approp		Expert Consensus	୫୫୫୫ 10-3 mSv	⊕⊕⊕⊕⊕ 10-30 mSv [ped]	1	1	8	2	0	1	2	0	0	1	0
MRI abdomen and pelvis without IV contrast	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	0	0	0	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	0	0	0	0	0	0
MRI chest without IV contrast	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	0	0	1	0	0	0	0

MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	0	0	0	1	0	0	0
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Variant 4: Adult. Ballistic penetrating torso trauma, limited to abdomen and pelvis, normotensive. Initial imaging.

	Appropriateness	GOT				3.5.11			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV contrast	Usually appropriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	9	9	0	0	0	0	0	0	2	3	9
		References		Study	Quality										
		47 (15128986)			2										
		46 (29412018)			2										
		45 (25023337)			4										
		44 (32889613)			2										
		10 (26984429)			2										
		9 (35322323)			2										
CTA abdomen and pelvis with IV contrast	Usually appropriate	Limited	���� 10-30 mSv)	9	9	0	0	0	1	4	0	1	1	7
		References		Study	Quality										
		29 (31903225)			4										
		33 (31283454)			4										
Radiography trauma series	Usually appropriate	Expert Consensus	≎≎≎ 1-10 mSv		8	8	1	0	0	1	0	0	3	3	6
CTA chest with IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	2	0	0	0	4	0	4	2	1
		References		Study	Quality						•	•			
		29 (31903225)		·	4										
		48 (17257952)			2										

CT chest with IV contrast	May l appropr (Disagree	riate	Expert Opinion	≎≎≎ 1-10 mSv	0	5	5	1	0	1	0	5	4	1	1	0
			References		Stud	y Quality										
			2 (26492022)			4										
CT abdomen and pelvis without and with IV contrast	May t		Limited	���� 10-3 mSv	30	4	4	2	2	2	4	3	0	0	0	0
			References		Stud	y Quality										
			31 (23480864)			4										
CT abdomen and pelvis without IV contrast	Usually appropr		Limited	&& 1-10 mSv	0	3	3	2	3	4	2	2	1	0	0	0
			References		Stud	y Quality										
			36 (35945464)			4										
CT chest without IV contrast	Usually appropr		Limited	≎≎≎ 1-10 mSv	9	2	2	6	2	3	3	0	0	0	0	0
			References		Stud	y Quality					-					
			36 (35945464)			4										
CT chest without and with IV contrast	Usually appropr		Limited	��� 1-10 mSv	0	1	1	8	1	1	1	2	1	0	0	0
			References		Stud	y Quality										
			31 (23480864)			4										
MRI abdomen and pelvis without IV contrast	Usually appropr		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	0	0	0	1	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usually appropr		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	0	0	0	1	0	0	0
MRI chest without IV contrast	Usually appropr		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually appropr		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0

Variant 5: Adult. Nonballistic penetrating torso trauma, unknown trajectory, normotensive. Initial imaging.

	Appropriateness	GOT		D 1 DD1	.	3.5.31			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT chest abdomen pelvis with IV contrast	Usually appropriate	Strong	���� 10-30 mSv	���� 3- 10 mSv [ped]	9	9	0	0	0	0	0	1	3	2	8
		References		Study	Quality										
		49 (31140225)			2										
		30 (30343384)			4										
		29 (31903225)			4										
		15 (31666333)			2										
		2 (26492022)			4		_								
Radiography trauma series	Usually appropriate	Limited	��� 1-10 mSv		9	9	1	0	0	0	1	0	2	2	8
		References		Study	Quality										
		50 (26463290)			4										
CTA chest abdomen pelvis with IV contrast	Usually appropriate	Limited	����� 30- 100 mSv	����� 10-30 mSv [ped]	7	7	0	0	0	1	0	1	5	2	4
		References		Study	Quality										
		29 (31903225)			4										
		33 (31283454)			4										
CT chest abdomen pelvis without IV contrast	Usually not appropriate	Limited	���� 10-30 mSv	���� 3- 10 mSv [ped]	3	3	4	1	4	2	2	1	0	0	0
		References		Study	Quality										
		36 (35945464)			4										

CT chest abdomen pelvis without and with IV contrast	Usually approp	Limited	���� 10-3 mSv	30	2	2	6	5	1	0	1	0	0	0	0
		References		Study	Quality										
		31 (23480864)			4										
MRI chest abdomen pelvis without and with IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	2	0	0	2	0	0	0	0
MRI chest abdomen pelvis without IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	0	0	1	0	0	0	0

Variant 6: Adult. Nonballistic penetrating torso trauma, limited to chest, normotensive. Initial imaging.

D 1	Appropri	ateness	COF	4.1.4. DD	, D 1 DD1	D (3.6.11			F	inal '	Гаbu	latio	ns		
Procedure	Categ		SOE	Adults RR	L Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography trauma series	Usua approp		Limited	��� 1-10 mSv)	9	9	1	0	0	0	1	0	1	2	9
			References		Stud	y Quality										
			50 (26463290)			4										
			51 (31407022)			2		_								
CT chest with IV contrast	Usua approp		Limited	≎≎≎ 1-10 mSv	9	8	8	0	0	0	0	0	0	3	5	5
			References		Stud	y Quality										
			37 (27324324)			3										
			51 (31407022)			2		_								
CTA chest with IV contrast	Usua approp		Limited	≎≎≎ 1-10 mSv	0	7	7	0	0	0	1	3	2	1	1	5
			References		Stud	y Quality										
			29 (31903225)			4										
			33 (31283454)			4										

CT abdomen and pelvis with IV contrast	May approp	riate	Expert Opinion		0	���� 3- 10 mSv	5	5	3	0	0	1	6	2	1	0	0
CT chest without IV contrast	(Disagre May approp	be	Limited	��� 1-10 mSv	0	[ped] ���� 3- 10 mSv [ped]	5	5	2	0	0	4	5	2	0	0	0
			References			Study	Quality		•	•	•	•				•	
			36 (35945464)				4										
CTA abdomen and pelvis with IV contrast	May approp		Limited	���� 10- mSv	30		4	4	0	1	5	1	6	0	0	0	0
			References														
			29 (31903225)														
			33 (31283454)														
CT abdomen and pelvis without and with IV contrast	Usuall approp		Limited	���� 10- mSv	-30 \$\frac{\phi \phi \phi \phi \phi \phi \phi}{\text{nSv}} \		3	6	1	4	1	2	0	0	0	0	
		References				Study	Quality										
			31 (23480864)														
CT abdomen and pelvis without IV contrast	Usuall approp		Limited	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	2	2	6	4	1	0	3	0	0	0	0
			References		Study Quality												
			36 (35945464)		4												
CT chest without and with IV contrast	Usuall approp		Limited	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	1	1	7	4	2	0	0	0	0	0	0
		References			Study Quality												
		31 (23480864)			4												
MRI abdomen and pelvis without IV contrast	Usuall approp		Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usuall approp	y not oriate	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	11	2	1	0	0	0	0	0	0

MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	0	0	1	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	2	0	1	1	0	0	0	0

Variant 7: Adult. Nonballistic penetrating torso trauma, limited to abdomen and pelvis, normotensive. Initial imaging.

D 1	Appropriate	eness	4 1 14 DDI	D I DDI	D 41	N. 11			F	inal '	Tabu	latio	ns		
Procedure	Category		Adults RRL	10 \$\$\$\$ 3-	Rating	Median	1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV contrast	Usually appropriat		��� 1-10 mSv	���� 3- 10 mSv [ped]	9	9	0	0	0	0	0	0	3	2	9
		References		Study	Quality										
		49 (31140225)			2										
		46 (29412018)			2										
		24 (29369452)													
		10 (26984429)													
		9 (35322323)			2		_								
Radiography trauma series	Usually appropriat		≎≎≎ 1-10 mSv		9	9	1	0	0	1	1	0	2	2	7
CTA abdomen and pelvis with IV contrast	May be appropriat		���� 10-3 mSv	0	6	6	0	0	0	0	6	2	1	1	3
		References		Study	Quality							•			
		33 (31283454)			4										
		29 (31903225)			4		_								
CTA chest with IV contrast	May be appropriat (Disagreeme	te Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	1	0	2	2	6	0	0	2	0
		References		Study	Quality										
		29 (31903225)													
		33 (31283454)			4										

CT abdomen and pelvis without IV contrast	May approp		Limited ⊕⊕⊕ 1-1 mSv		0	���� 3- 10 mSv [ped]	4	4	4	2	1	2	4	1	0	0	0
	•		References		Study Quality												
			36 (35945464)				4										
CT chest with IV contrast	May be appropriate		Expert Consensus	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	4	4	1	0	3	3	4	2	0	0	0
CT abdomen and pelvis without and with IV contrast			���� 10∹ mSv	30	≎≎≎≎≎ 10-30 mSv [ped]	2	2	5	5	3	0	0	0	0	0	0	
	References						•				•						
			31 (23480864)			4											
CT chest without IV contrast	Usually approp		Limited	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	2	2	7	2	3	1	1	0	0	0	0
		References			Study Quality						•	•					
		31 (23480864)				4											
CT chest without and with IV contrast		ually not Expert ���		��� 1-10 mSv	0	���� 3- 10 mSv [ped]	2	2	7	1	3	2	1	0	0	0	0
MRI abdomen and pelvis without IV contrast		Usually not E appropriate Cor		O 0 mSv	,	O 0 mSv [ped]	1	1	12	1	0	0	0	0	1	0	0
MRI abdomen and pelvis without and with IV contrast	Usually approp			O 0 mSv	,	O 0 mSv [ped]	1	1	10	2	0	0	1	1	0	0	0
MRI chest without IV contrast	Usually approp		Expert Consensus O 0 mS		,	O 0 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually approp		Expert Consensus			O 0 mSv [ped]	1	1	12	1	1	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.