American College of Radiology
ACR Appropriateness Criteria®

Major Blunt Trauma

Variant 1: Adult. Major blunt trauma. Hemodynamically unstable. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations 1	2	3	4	5	6	7	8	9
Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		9	9	0	0	0	0	1	0	2	1	7
References				Study Quality											
13 (29950261)				4											
14 (33703916)				2											
CT whole body with IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		6	6	0	0	0	0	4	3	1	1	2
References				Study Quality											
9 (23894365)				4											
11 (33795900)				4											
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	4	0	0	1	1	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	3	2	0	1	0	0	0	0
CT whole body without IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		2	2	4	4	1	1	0	1	0	0	0
References				Study Quality											
12 (26122129)				4											

Variant 2: Adult. Major blunt trauma. Hemodynamically stable. Not otherwise specified. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT whole body with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		9	9	0	0	0	0	0	0	3	2	6
References	Study Quality														
18 (25250591)	Good														
17 (23949104)	3														
9 (23894365)	4														
20 (27163732)	2														
19 (28610777)	Good														
Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		8	8	0	0	0	0	1	0	3	2	5
References	Study Quality														
13 (29950261)	4														
14 (33703916)	2														
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	3	0	1	1	1	0	0	0
CT whole body without IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		2	2	2	4	3	2	0	0	0	0	0
References	Study Quality														
9 (23894365)	4														
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	2	0	1	1	1	0	0	0

Variant 3: Adult. Major blunt trauma. Hemodynamically stable. Suspected facial injury. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT head without IV contrast	Usually	Limited	☢☢☢ 1-10	☢☢☢ 0.3-	9	9	0	0	1	0	1	0	2	0	7

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
	appropriate		mSv	3 mSv [ped]											
	References		Study Quality												
	3 (33958108)		4												
Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		9	9	0	0	1	0	0	1	3	0	6
	References		Study Quality												
	13 (29950261)		4												
	14 (33703916)		2												
CT maxillofacial without IV contrast	Usually appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	8	8	0	0	0	1	0	1	1	5	3
CTA head and neck with IV contrast	Usually appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	0	0	1	2	6	1	1
CT whole body with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	0	1	0	0	0	1	5	3	1
	References		Study Quality												
	18 (25250591)		Good												
	17 (23949104)		3												
	9 (23894365)		4												
	20 (27163732)		2												
	19 (28610777)		Good												
CT whole body without IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		4	4	2	1	2	3	3	0	0	0	0
	References		Study Quality												
	9 (23894365)		4												
CT head with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	3	8	0	0	0	0	0	0	0

CT maxillofacial with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	3	4	3	1	0	0	0	0	0
MRI head without IV contrast abbreviated	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	4	3	2	0	1	0	0	0	1
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	6	5	0	0	0	0	0	0	0
CT maxillofacial without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	7	3	0	1	0	0	0	0	0

Variant 4: Adult. Major blunt trauma. Hemodynamically stable. Suspected extremity trauma. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography extremity area of interest	Usually appropriate	Expert Consensus	Varies	Varies	8	8	0	0	0	0	0	0	3	3	5
CT whole body with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	0	1	0	0	3	1	1	2	3

References	Study Quality
18 (25250591)	Good
17 (23949104)	3
9 (23894365)	4
20 (27163732)	2
19 (28610777)	Good

Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		7	7	0	0	0	1	1	0	4	3	2

References	Study Quality
13 (29950261)	4
14 (33703916)	2

CTA extremity area of interest with IV contrast	May be appropriate	Limited	Varies	Varies	6	6	1	0	0	0	3	4	2	0	1

References	Study Quality
9 (23894365)	4
12 (26122129)	4
24 (24056401)	2
23 (33642083)	4

CT whole body without IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		3	3	3	2	1	3	1	0	0	1	0

References	Study Quality
9 (23894365)	4
24 (24056401)	2
12 (26122129)	4

CT extremity area of interest with IV contrast	Usually not appropriate	Limited	Varies	Varies	2	2	2	6	1	1	1	0	0	0	0

References	Study Quality
9 (23894365)	4
23 (33642083)	4

CT extremity area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	4	2	2	1	1	0	0	1	0
US duplex Doppler extremity area of interest	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	4	0	0	2	0	0	0	0
CT extremity area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	2	5	1	1	2	0	0	0	0

Variant 5: Adult. Major blunt trauma. Hemodynamically stable. Suspected bowel or mesenteric trauma. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV	Usually	Limited	☢☢☢ 1-10	☢☢☢☢ 3-	9	9	0	0	0	0	1	0	2	2	6

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
contrast	appropriate		mSv	10 mSv [ped]											

References	Study Quality
26 (30201138)	4
27 (33909460)	4
25 (23624596)	Inadequate

CTA abdomen and pelvis with IV contrast	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	8	8	1	0	0	0	3	0	1	2	4

References	Study Quality
26 (30201138)	4
27 (33909460)	4
24 (24056401)	2

CT whole body with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	0	0	0	1	1	1	3	2	3

References	Study Quality
18 (25250591)	Good
17 (23949104)	3
25 (23624596)	Inadequate
9 (23894365)	4
20 (27163732)	2
19 (28610777)	Good
27 (33909460)	4
26 (30201138)	4

Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		7	7	0	0	0	1	1	1	3	1	4

References	Study Quality
13 (29950261)	4
14 (33703916)	2

CT abdomen and pelvis without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	2	1	1	3	3	1	0	0	0
	References		Study Quality												
	9 (23894365)		4												
CT whole body without IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		4	4	1	3	1	4	1	0	1	0	0
	References		Study Quality												
	9 (23894365)		4												
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	2	6	2	0	0	0	0	0	1
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	4	2	1	1	2	1	0	0	0
US abdomen	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	3	6	1	0	0	0	1	0	0
	References		Study Quality												
	28 (36882128)		2												
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	2	0	1	1	1	0	0	0

Variant 6: Adult. Major blunt trauma. Hemodynamically stable. Suspected urinary system trauma. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	0	0	0	3	4	4
	References		Study Quality												
	12 (26122129)		4												
	24 (24056401)		2												

		25 (23624596)		Inadequate												
CT whole body with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	0	0	0	1	2	1	2	3	2
		References		Study Quality												
		18 (25250591)		Good												
		17 (23949104)		3												
		25 (23624596)		Inadequate												
		9 (23894365)		4												
		20 (27163732)		2												
		19 (28610777)		Good												
Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		7	7	0	0	1	0	1	3	1	0	5
		References		Study Quality												
		13 (29950261)		4												
		14 (33703916)		2												
CTA abdomen and pelvis with IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	6	6	1	0	0	0	4	1	1	1	3
		References		Study Quality												
		9 (23894365)		4												
		12 (26122129)		4												
		24 (24056401)		2												
		23 (33642083)		4												
CT pelvis with bladder contrast (CT cystography)	May be appropriate (Disagreement)	Expert Opinion	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	1	1	4	1	2	0	2
		References		Study Quality												
		29 (32391715)		4												
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	3	3	0	4	2	0	4	0	0	1	0

Fluoroscopy retrograde urethrography	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	3	3	2	3	2	1	2	0	1	0	0
	References		Study Quality												
	31 (30605143)		1												
CT whole body without IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		3	3	3	1	4	0	2	1	0	0	0
	References		Study Quality												
	9 (23894365)		4												
	11 (33795900)		4												
CT abdomen and pelvis without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	2	4	3	2	0	0	0	0	0
	References		Study Quality												
	9 (23894365)		4												
CTU without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	3	3	2	0	2	1	0	0	0
	References		Study Quality												
	30 (31494707)		4												
	31 (30605143)		1												
Fluoroscopy cystography	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		2	2	3	4	2	0	2	0	0	0	0
	References		Study Quality												
	29 (32391715)		4												
Radiography intravenous urography	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	4	5	2	0	0	0	0	0	0
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	0	1	3	1	0	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	1	1	1	2	0	0	0	0

MRU without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	2	0	0	0	0	0	1	0
US abdomen and pelvis	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	6	2	2	0	1	0	0	0	0

References	Study Quality
28 (36882128)	2

Variant 7: Adult. Major blunt trauma. Hemodynamically stable. Suspected chest trauma. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTA chest with IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	9	9	0	0	1	0	2	0	1	1	6

References	Study Quality
12 (26122129)	4

CT chest with IV contrast	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	9	9	0	0	0	0	0	0	3	2	6

References	Study Quality
20 (27163732)	2
9 (23894365)	4
13 (29950261)	4
28 (36882128)	2

Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		8	8	0	0	1	0	0	0	3	3	4

References	Study Quality
13 (29950261)	4
14 (33703916)	2

CT whole body with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		7	7	0	0	0	1	1	1	3	3	2

References	Study Quality
18 (25250591)	Good
17 (23949104)	3
25 (23624596)	Inadequate
9 (23894365)	4
20 (27163732)	2
19 (28610777)	Good

CT whole body without IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		4	4	2	2	1	4	1	1	0	0	0

References	Study Quality
9 (23894365)	4

CT chest without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	2	2	3	4	0	0	0	0	0

References	Study Quality
9 (23894365)	4

CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	3	3	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	6	2	1	1	0	1	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	2	1	0	1	1	0	0	0
US chest	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	6	4	0	0	1	0	0	0	0

References	Study Quality
4 (29146418)	2
6 (31597173)	4

Variant 8: Major blunt trauma. Hemodynamically stable. Pregnant patient. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US pregnant uterus	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	2	0	0	2	7

References	Study Quality
28 (36882128)	2

CT abdomen and pelvis with IV contrast	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	0	0	3	2	3	3	0

References	Study Quality
24 (24056401)	2
31 (30605143)	1
25 (23624596)	Inadequate

Radiography trauma series	Usually appropriate	Limited	☢☢☢ 1-10 mSv		7	7	0	0	0	1	1	2	2	2	3

References	Study Quality
13 (29950261)	4
14 (33703916)	2

CT whole body with IV contrast	May be appropriate	Strong	☢☢☢☢ 10-30 mSv		6	6	0	0	0	1	2	3	2	3	0

References	Study Quality
18 (25250591)	Good
17 (23949104)	3
9 (23894365)	4
20 (27163732)	2
19 (28610777)	Good

CTA abdomen and pelvis with IV contrast	May be appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	5	5	1	0	0	3	2	1	3	1	0

References	Study Quality
24 (24056401)	2

CTA chest with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	1	0	0	2	3	1	2	2	0
	References		Study Quality												
	9 (23894365)		4												
CT abdomen and pelvis without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	3	1	4	1	1	1	0	0	0
	References		Study Quality												
	9 (23894365)		4												
CT whole body without IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv		3	3	3	1	3	1	2	1	0	0	0
	References		Study Quality												
	9 (23894365)		4												
	24 (24056401)		2												
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	2	2	5	2	3	1	0	0	0	0	0
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	3	2	0	0	1	0	0	0
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	1	1	1	2	0	0	1	0
US abdomen and pelvis	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	4	6	1	0	0	0	0	0	0
	References		Study Quality												
	28 (36882128)		2												
US pelvis	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	4	7	0	0	0	0	0	0	0
	References		Study Quality												
	28 (36882128)		2												

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.**