American College of Radiology ACR Appropriateness Criteria®

Management of Acute Pulmonary Embolism

Variant 1: Adult. Extensive acute bilateral central pulmonary emboli. Sustained hypotension for more than 15 minutes. Initial therapy.

	Appropriateness	~ ~ -	SOE Adults RRL Peds RRL Rating Median Limited N/A N/A 9 9 References Study Quality 10 (34352279) 4 Limited N/A N/A 8 8 References Study Quality 22 (25631770) 4 21 (24917641) Not Assessed Strong N/A N/A 7 7 References Study Quality 20 (32199827) 2 19 (35487534) Good Good						F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Anticoagulation	Usually appropriate	Limited	N/A	N/A	9	9	0	0	0	0	1	1	2	2	8
		References		Study	Quality								•		
		10 (34352279)			4										
Systemic thrombolysis	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	1	0	5	4	4
		References		Study	Quality								•		
		22 (25631770)			4										
				Not A	Assessed										
Surgical embolectomy pulmonary artery	Usually appropriate	Strong	N/A	N/A	7	7	0	0	0	0	1	1	4	3	1
		References		Study	Quality								•		
		20 (32199827)			2										
		19 (35487534)		C	Good										
		18 (26077690)			2										
Catheter-directed therapy pulmonary artery	Usually appropriate	Strong	N/A	N/A	7	7	0	0	1	0	1	5	2	2	3
		References		Study	Quality										
		14 (35588898)			1										
		13 (36349702)			2										

			11 (25856269) 12 (26315743)			2 2										
Extracorporeal membrane oxygenation	May approp	be briate	Strong	N/A	N/A	6	6	0	0	0	0	5	5	2	1	1
			References		Study	Quality			,				,			
			17 (33974966)			2										
			16 (32505687)			2										
			15 (32153003)			4										

Variant 2: Adult. Acute bilateral pulmonary emboli. RV/LV ratio greater than 0.9 on CTA. Evidence of right heart strain on echocardiogram. Elevated troponin level. No hypotension. Initial therapy.

D 1	Appropriateness	COF	A I I DDI	D 1 DD1	D 4	3.5 3.			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Anticoagulation	Usually appropriate	Limited	N/A	N/A	9	9	0	0	0	0	0	0	2	2	10
		References		Study	Quality										
		10 (34352279)			4										
Catheter-directed therapy pulmonary artery	Usually appropriate	Strong	N/A	N/A	8	8	0	0	0	0	0	0	3	6	5
		References		Study	Quality						•				
		28 (36210021)			2										
		27 (33454291)			2										
		23 (24226805)			1										
		24 (30025734)			1										
		25 (34167677)			1										
		26 (31072507)			2										
		11 (25856269)			2										
		12 (26315743)			2										
		13 (36349702)			2										
		14 (35588898)			1										

Surgical embolectomy pulmonary artery	May approp (Disagre	riate	Expert Opinion	N/A		N/A	5	5	0	0	2	1	5	1	0	1	0
			References			Study	Quality										
			30 (29659045)				2										
			29 (26165484)				3										
Systemic thrombolysis	Usuall approp	y not oriate	ot e Strong N//			N/A	3	3	0	3	3	0	4	0	0	0	0
			References			Study	Quality										
			References 32 (28335835)				1										
			31 (24716681)				1										
			31 (24716681) 21 (24917641)			Not A	Assessed										
			21 (24917641) 22 (25631770)				4		_								
Extracorporeal membrane oxygenation	Usuall approp	y not oriate	Expert Consensus	N/A		N/A	2	2	5	3	5	0	0	1	0	0	0

Variant 3: Adult. Acute bilateral pulmonary emboli. RV/LV ratio less than 0.9 on CTA. No right heart strain on echocardiogram. Normal troponin level. No hypotension. Initial therapy.

	Appropri	ateness	GOT.	4.1.14. DD		D I DDI	D (1	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
Anticoagulation	Usua approp	.*	Limited	N/A		N/A	9	9	0	0	0	0	0	0	0	2	12
			References 10 (34352279)			Study	Quality										
			10 (34352279)				4										
			33 (29498138)			Not A	Assessed										
Catheter-directed therapy pulmonary artery	Usually approp		Expert Consensus	N/A		N/A	3	3	4	1	6	1	0	2	0	0	0
Systemic thrombolysis	Usually approp		Expert Consensus	N/A		N/A	1	1	10	2	0	0	1	0	0	1	0

Extracorporeal membrane oxygenation	Usually no appropriate	*	N/A	N/A	1	1	11	3	0	0	0	0	0	0	0
Surgical embolectomy pulmonary artery	Usually no appropriate	Limited	N/A	N/A	1	1	10	3	1	0	0	0	0	0	0
		References 34 (21481423)		Study	Quality										

Variant 4: Adult. Acute saddle pulmonary embolism. Normal RV/LV ratio on CTA. Normal troponin level. No hypotension. Initial therapy.

Day on James	Appropri	iateness	COF	A .l14 D.D	. T	D. J. DDI	D - 43	M - 11			F	inal '	Гаbu	latio	ns		
Procedure	Categ		SOE	Adults RR	KL .	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Anticoagulation	Usua approp		Limited	N/A		N/A	9	9	0	0	0	0	0	0	0	2	12
			References			Study	Quality										
			10 (34352279)				4										
Catheter-directed therapy pulmonary artery	Usuall approp		Expert Consensus	N/A		N/A	3	3	2	3	4	0	1	0	0	0	0
Systemic thrombolysis	Usuall approp		Expert Consensus	N/A		N/A	2	2	5	3	2	0	0	0	0	0	0
Extracorporeal membrane oxygenation	Usuall approp		Expert Consensus	N/A		N/A	1	1	9	3	1	1	0	0	0	0	0
Surgical embolectomy pulmonary artery	Usuall approp		Limited	N/A		N/A	1	1	8	2	3	0	0	0	0	1	0
			References			Study	Quality										
			References 34 (21481423)				2										

Variant 5: Adult. Acute bilateral central pulmonary emboli. Evidence of right heart failure on echocardiogram. Sustained a syncopal event with head trauma and acute intracranial hemorrhage. Initial therapy.

ъ .	Appropri	ateness	COF	A L LA DDI	D I DDI	D 4	3.7.11			F	inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Catheter-directed therapy pulmonary artery	Usua approp		Strong	N/A	N/A	8	8	0	0	0	0	0	0	4	6	4
			References		Study	Quality										
			27 (33454291)			2										
			42 (31634603)			2										
			43 (28214482)			3										
Extracorporeal membrane oxygenation	May approp		Limited	N/A	N/A	5	5	3	0	1	3	5	1	1	0	0
			References		Study	Quality										
			44 (33275707)			4										
Surgical embolectomy pulmonary artery	May approp (Disagree	riate	Expert Opinion	N/A	N/A	5	5	0	5	2	1	0	1	1	0	0
			References		Study	Quality										
			45 (35574955)		Inac	lequate				_						
Anticoagulation	May approp		Limited	N/A	N/A	4	4	1	1	4	2	5	0	0	1	0
			References		Study	Quality										
			40 (17534695)			4										
			41 (29642222)			4										
Systemic thrombolysis	Usually approp		Expert Consensus	N/A	N/A	1	1	13	1	0	0	0	0	0	0	0

Variant 6: Adult. Acute thromboembolism in transit. Thrombus in the right atrium. Sustained hypotension for more than 15 minutes. Initial therapy.

D 1	Appropriateness	GOT.	A L L DDI	n i nni	D (1	3.6.11			F	inal [Fabu	lation	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Anticoagulation	Usually appropriate	Strong	N/A	N/A	9	9	0	0	0	0	0	0	2	0	8

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	F 3	inal '	Tabu 5	latio		8	9
		References		Study	Quality										
		51 (36384306)			4										
		50 (30373436)			2										
		48 (25832601)			4										
		49 (29111332)			4										
		47 (28011316)			2		-	1							
Surgical embolectomy right heart	Usually appropriate	Limited	N/A	N/A	7	7	0	0	0	0	0	1	6	2	1
		References		Study	Quality										
		53 (36661312)			2										
Catheter-directed therapy right heart	Usually appropriate	Limited	N/A	N/A	7	7	0	0	0	0	4	1	4	1	0
		References		Study	Quality										
		52 (35722436)			4										
Systemic thrombolysis	May be appropriate	Limited	N/A	N/A	6	6	0	0	0	0	3	3	2	2	0
		References		Study	Quality										
		51 (36384306)			4										
		50 (30373436)			2										
		48 (25832601)			4										
		49 (29111332)			4										
Extracorporeal membrane oxygenation	May be appropriate	Expert Consensus	N/A	N/A	5	5	0	0	0	0	7	3	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.