## American College of Radiology ACR Appropriateness Criteria®

## **Multiple Gestations**

Variant 1: Known or suspected multiple gestations. Monochorionic or dichorionic. First trimester. Initial imaging.

	Appropriateness	207							I	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRI	L Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US pregnant uterus transabdominal	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	3	7
		References		Study	Quality										
		32 (27363529)			3										
		34 (24585501)			4										
		28 (21308842)			3										
		24 (27180271)		(	Good										
		27 (29115085)			4										
		33 (27622859)			3										
		30 (25989950)			3										
		9 (32861686)			4										
		29 (23754823)			4										
		31 (26466907)			3										
		35 (31710737)			3		_								
US pregnant uterus transvaginal	Usually appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	0	4	2	3	1
		References		Study	Quality										
		24 (27180271)		(	Good										
		9 (32861686)			4										

US cervix transvaginal	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	4	3	3	1	0	0	0	0	0
		References		Study	Quality										
		25 (26363481)			3										
		26 (28942691)			4										
US assessment for TTTS	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	5	0	2	3	0	0	0	0	0
		References		Study	Quality										
		9 (32861686)			4										
US pregnant uterus biophysical profile	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	0	0	0	0	0	0	0	0
US echocardiography fetal	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	1	1	7	1	1	1	0	0	0	0	0
		References		Study	Quality										
		9 (32861686)			4										
US duplex Doppler fetal middle cerebral artery	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0
US duplex Doppler fetal umbilical artery	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	1	1	8	1	1	0	0	0	0	0	0
		References		Study	Quality			•	•	•	•	•	•	•	
		9 (32861686)			4										
MRI fetal without and with IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0
MRI fetal without IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0

## Variant 2: Multiple gestations. Monochorionic or dichorionic. First trimester. First trimester ultrasound performed. Next imaging study.

, n	Appropriateness	TOD	A L L DDI	D 1 DD1	<b>D</b> 4	36.11			F	inal '	Tabu	ılatio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9

	Appropriateness	COF	A L L DDI	D I DDI	D (1	3.6.11			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US pregnant uterus transabdominal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	1	0	2	7
		References		Study	Quality										
		38 (21234973)			4										
		40 (24371108)			3										
		39 (27766995)			4										
		5 (31697621)			4										
		33 (27622859)			3										
		9 (32861686)			4										
		37 (31773823)			3										
		14 (31788879)			3										
		15 (32852128)			4										
		16 (34839475)			4			1		,	1				
US pregnant uterus transvaginal	Usually appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	0	5	2	1	2
US cervix transvaginal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	0	0	4	4	2	0	0	0
		References		Study	Quality										
		25 (26363481)			3										
		26 (28942691)			4										
US echocardiography fetal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	4	4	0	0	2	5	1	3	0	0	0
		References		Study	Quality		•		•	•	•		•	•	
		15 (32852128)			4										
		16 (34839475)			4										
US assessment for TTTS	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	3	1	2	2	1	0	1	0	0
		References		Study	Quality										

		36 (17444560)				3										
		33 (27622859)				3										
		9 (32861686)				4										
US pregnant uterus biophysical profile	Usually approp	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	10	0	0	0	0	0	0	0	0
US duplex Doppler fetal middle cerebral artery	Usually approp	Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	8	1	0	0	0	1	0	0	0
		References			Study	Quality										
		9 (32861686)				4										
US duplex Doppler fetal umbilical artery	Usually approp	Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	7	1	1	0	0	0	0	0	1
		References			Study	Quality										
		9 (32861686)				4										
MRI fetal without and with IV contrast	Usually approp	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0
MRI fetal without IV contrast	Usually approp	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0

Variant 3: Multiple gestations. Dichorionic twins or multichorionic higher order multiples. Second trimester anatomy examination. Follow-up imaging.

Don and James	Appropriateness	SOF	A J14- DDI	D. J. DDI	D - 45	N/ - 12			F	inal '	Tabul	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US pregnant uterus transabdominal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	1	9
		References		Study	Quality										
		47 (26428508)			4										
		5 (31697621)			4										
		41 (30308091)			4										
US echocardiography fetal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	1	3	1	4	1

						y Quality										
			46 (22713497)			4										
US cervix transvaginal	Usua approp		Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	2	2	3	1	2
			References		Study	y Quality										
			44 (27133011)			4										
			43 (31878811)			4										
US pregnant uterus transvaginal	May approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	0	7	1	0	1
US duplex Doppler fetal umbilical artery	May approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	5	4	2	0	0	0
US duplex Doppler fetal middle cerebral artery	Usuall approp		Limited	O 0 mSv	O 0 mSv [ped]	3	3	2	2	5	0	0	1	0	0	0
			References		Study	y Quality										
			45 (19012187)			4										
US pregnant uterus biophysical profile	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	1	2	0	1	1	0	0	0
US assessment for TTTS	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	1	2	1	0	1	0	0	0
MRI fetal without IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	2	0	2	0	1	0	0	0
MRI fetal without and with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0

Variant 4: Multiple gestations. Monochorionic twins. Second trimester anatomy examination. Follow-up imaging.

	Appropriateness	COE	A L L DDI	D 1 DD1	<b>D</b> (1	3.5.31			F	inal '	Гаbu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US pregnant uterus transabdominal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	1	9

	Appropriateness	207							F	inal '	Tabu	latio	ıs		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4				8	9
		References		Study	Quality										
		54 (25925425)			4										
		49 (20516671)			4										
		55 (24011780)			3										
		56 (29024208)			3										
		57 (31875322)			3										
		9 (32861686)			4										
		41 (30308091)			4										
		58 (20215730)			3										
US echocardiography fetal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	6
		References		Study	Quality										
		53 (25560113)			4										
		52 (23223160)			4										
		9 (32861686)			4										
US assessment for TTTS	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	2	7
		References		Study	Quality										
		12 (27561094)			3										
		9 (32861686)			4										
US duplex Doppler fetal umbilical artery	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	6
		References		Study	Quality			•	•						
		9 (32861686)			4										
US cervix transvaginal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	0	3	3	2	1

		References		Study	Quality										
		44 (27133011)		Staay	4										
		47 (26428508)			4										
		49 (20516671)			4										
		48 (30107361)			3										
		43 (31878811)			4	_	_								
US pregnant uterus transvaginal	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	0	6	2	0	1
US duplex Doppler fetal middle cerebral artery	May be appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	1	7	0	1	1
		References		Study	Quality										
		References 20 (-3120926)			4										
		3 (26094734)			2										
		9 (32861686)			4										
		50 (31277521)			4										
		51 (31605505)		1	4		_								
MRI fetal without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	5	2	4	0	0	0
US pregnant uterus biophysical profile	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	4	1	1	0	0	0	0	0
MRI fetal without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	0	1	0	0	0	0	0	0

Variant 5: Multiple gestations. Dichorionic twins or multichorionic higher order multiples. Growth and antepartum surveillance.

D 1	Appropriateness	COF	A L L DDY	n i nni	D (1	3.6.11			F	inal '	Гаbu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US pregnant uterus transabdominal	Usually appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	1	9

US pregnant uterus transvaginal	May	be	Expert	O 0 mSv	O 0 mSv	6	6	0	0	0	1	3	3	2	0	1
	approp		Consensus	0 0 11150	[ped]	6	6	0	U	U	1	3	3	2	0	1
US cervix transvaginal	May approp		Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	1	0	0	3	3	2	0	1
			References		Study	Quality										
			43 (31878811)			4										
US duplex Doppler fetal umbilical artery	May approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	1	1	3	4	0	1	0
US pregnant uterus biophysical profile	May approp		Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	0	6	3	1	1	0
			References		Study	Quality										
			62 (17154226)			3										
			63 (26453124)			3										
US echocardiography fetal	May approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	2	4	2	0	0	0
US duplex Doppler fetal middle cerebral artery	May approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	3	3	3	0	0	0
US assessment for TTTS	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	4	2	1	2	0	1	0	0	0
MRI fetal without IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	5	2	1	1	0	1	0	0	0
MRI fetal without and with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	0	0	0	0	0	0	0	0

Variant 6: Multiple gestations. Monochorionic twins. Growth and antepartum surveillance.

Procedure	Appropriateness	COE	A L L DDI	D I DDI	D 41	3.7. 11			F	inal '	Гabu	latio	ns		
	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US pregnant uterus transabdominal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	1	9

ъ. 1	Appropriateness	COF	A L L DDY	D I DDI	<b>.</b>	3.6.11			I	inal	Tabul	lation	ıs		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
		References		Study	Quality		_								
		12 (27561094)			3										
		9 (32861686)			4										
US assessment for TTTS	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	6
		References		Study	Quality										
		12 (27561094)			3										
		9 (32861686)													
		13 (30306664)			4										
US duplex Doppler fetal umbilical artery	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	6
		References		Study	Quality										
		42 (27062653)		3											
		9 (32861686)		4				•							
US duplex Doppler fetal middle cerebral artery	Usually appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	1	3	3	1	2
		References		Study	Quality										
		3 (26094734)			2										
		9 (32861686)			4										
		50 (31277521)			4										
		51 (31605505)			4										
US pregnant uterus biophysical profile	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	2	5	3	1	0
		References		Study Quality											
		62 (17154226)		3											
		63 (26453124)		3											

US pregnant uterus transvaginal	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	1	5	2	0	1
US cervix transvaginal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	4	6	0	0	0
		References		Study Quality											
		43 (31878811)			4										
US echocardiography fetal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	2	3	1	1	2
		References		Study	Quality			•							
		12 (27561094)		3											
		9 (32861686)		4			_								
MRI fetal without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	2	1	0	2	4	1	0	0	0
		References		Study Quality											
		17 (25377504)		3			_								
MRI fetal without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	0	0	0	0	0	0	0

Variant 7: Multiple gestations. Dichorionic or multichorionic higher order multiples or monochorionic gestations. Known abnormality or discordance between fetuses (fluid, size, weight). Growth and antepartum surveillance.

Procedure	Appropriateness	ppropriateness		D I DDI	D .:	3.6.11	Final Tabulations												
	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9				
US pregnant uterus transabdominal	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	1	9				

References	Study Quality
84 (24751835)	M
83 (29363848)	4
4 (29287298)	4
9 (32861686)	4

		58 (20215730)		3											
US duplex Doppler fetal umbilical artery	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	2	0	3	2	3
		References		Study	y Quality	•				·				•	
		70 (14533898)			4										
		76 (21962139)			3										
		77 (20878679)			3										
		42 (27062653)													
		75 (32573847)		3 3											
US pregnant uterus biophysical profile	Usually appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	1	4	3	0	2
US duplex Doppler fetal middle cerebral artery	Usually appropriate	Moderate	O 0 mSv	v O 0 mSv 7 7			0	0	0	0	2	2	4	1	1
		References		Study	y Quality	•			•	•		•		•	
		3 (26094734)		2											
		74 (22418955)			4										
		72 (30125414)			3										
		73 (30207009)		3											
		51 (31605505)		4							,				
US pregnant uterus transvaginal	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	3	7	1	0	0
US echocardiography fetal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	3	4	1	0	1
		References		Study	y Quality	•	'		•		'			•	
		52 (23223160)		•	4										
		78 (24919586)		3											
		32 (27363529)	3 3												
		79 (21998013)													
		81 (23495173)			3										
		80 (27150066)			3										
		82 (27813120)			3										

		22 ( 24 2 5 4 2 4 )													
		22 (-3196434)			4										
		58 (20215730)			3			I	1	1	_	I	I		
US assessment for TTTS	May be appropriate	Limited Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	3	3	4	0	0
		References		Study											
		70 (14533898)			4										
		69 (23617829)			4										
		5 (31697621)			4										
		12 (27561094)		3											
		4 (29287298)		4											
		9 (32861686)			4										
		71 (32832884)			3										
MRI fetal without IV contrast	May be appropriate	e Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	2	3	2	3	0	0
		References		Study	Quality										
		17 (25377504)		3											
		67 (29688161)		3											
		18 (28444780)		3											
		66 (31220847)			3										
		65 (26268524)			3										
		68 (32358676)			3	_									
US cervix transvaginal	May be appropriate	e Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	2	4	5	0	0	0
		References	References		Study Quality										
		43 (31878811)		4											
MRI fetal without and with IV contrast	Usually no appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	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.