# American College of Radiology ACR Appropriateness Criteria®

# **Brain Tumors**

Variant 1: Adult. Primary brain tumor screening. Genetic risk factors.

D 1	Appropri	ateness	COE	A L LL DDI	D I DDI	D 41	37.1			F	inal '	Tabu	latio	ns		
Procedure	Catego		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usual appropi		Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	1	0	0	1	3	2	10
			References		Study	Quality										
			24 (28620005)			4										
			25 (34633580)			4										
MRI head without IV contrast	May appropri		Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	0	1	9	5	0	0	0
		•	References		Study	Quality										
			25 (34633580)			4										
			26 (28572266)			4										
MRI complete spine without and with IV contrast	May appropri		Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	1	2	3	8	1	0	0	0
			References		Study	Quality										
			21 (34806136)			4										
			24 (28620005)			4		_							_	
CT head with IV contrast	Usually appropr		Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	13	1	0	1	0	0	2	0	0
CT head without IV contrast	Usually appropr		Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	14	1	1	1	0	0	0	0	0

	Expert Consensus	��� 1-10 mSv	0	1	1	13	2	0	0	0	0	2	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	1	1	0	0	0	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	1	0	0	0	1	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	1	1	0	0	0	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	2	0	0	0	1	0
	Expert Consensus	��� 1-10 mSv	0	1	1	15	1	0	0	0	0	1	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	2	0	1	0	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	1	0	1	0	0	1
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	3	1	0	0	0	0	0	0
	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	1	0	0	0	1	0	0
	Expert Consensus	���� 10-3 mSv	30	1	1	15	1	0	0	1	0	0	0	0
	Limited	��� 1-10 mSv	)	1	1	11	1	1	2	0	0	1	1	0
	References		Stud	y Quality		•			•			•	•	•
	22 (35961372)			4										
	23 (30777201)			2										
	Expert Consensus	��� 1-10 mSv	)	1	1	15	1	0	0	0	0	1	0	0
appropri  Usually appropri	Usually not appropriate  Usually not appropriate	appropriate Consensus  Usually not Expert Consensus  Usually not appropriate Consensus  Usually not Expert Consensus  Usually not appropriate Consensus  Usually not Expert Consensus  Usually not Expert Consensus  Usually not Expert Consensus  Expert Consensus  Usually not Expert Consensus  Usually not Expert Consensus  Expert Consensus  Expert Consensus  Usually not Expert Consensus	Appropriate  Usually not appropriate  Expert O0 0 mSv  O 0 mSv  O 0 mSv  O 0 mSv  O 0 mSv  Usually not appropriate  Usually not appropriate  Expert Onesensus  O 0 mSv  Usually not appropriate  Usually not appropriate  Expert Onesensus  O 0 mSv	Usually not appropriate  Usually not Expert Consensus  Usually not appropriate  Usually not Expert See 1-10  Weet 1-10  MSV	Usually not appropriate   Expert Consensus   D 0 mSv [ped]   1	Usually not appropriate   Expert Consensus   D 0 mSv   [ped]   D mSv   D mSv   [ped]   D mSv   D mSv	Usually not appropriate   Expert Consensus   D 0 mSv   D 0 mSv	Usually not appropriate   Expert Consensus   D 0 mSv	Usually not appropriate   Expert Consensus   D 0 mSv   D 0 mSv	Usually not appropriate   Expert Consensus   D 0 mSv   D 0 mSv	Usually not appropriate   Consensus   Co	Usually not appropriate   Consensus   Co	Usually not appropriate   Consensus   Co	Usually not appropriate   Consensus   Co

Fluciclovine PET/MRI brain	Usuall approp	• .	Expert Consensus	��� 1-1 mSv	0		1	1	15	1	0	0	1	0	0	0	0
DOTATATE PET/MRI brain	Usuall approp		Limited	��� 1-1 mSv	0		1	1	11	1	1	2	0	0	1	1	0
			References			Study	Quality										
			22 (35961372)				4										
			23 (30777201)				2										

### Variant 2: Adult. Secondary or metastatic brain tumor screening. Extracranial malignancy.

, n	Appropriatenes	S	A L IV DDI	D I DDI	D 4	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
MRI head without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	1	0	0	2	2	11
		References		Study	Quality										
		32 (32065345)			4										
		29 (-3197191)			4										
		30 (37245883)			4										
		31 (29799956)			2										
MRI head without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	1	2	11	1	0	0	0
		References		Study	Quality		-								
		29 (-3197191)			4										
		30 (37245883)			4			_							
MRI complete spine without and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	2	0	2	5	7	0	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	3	1	0	0	0	0	0	0

CT head without IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	2	1	2	0	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv	���� 3- 10 mSv [ped]	1	1	11	3	1	0	0	1	0	0	0
MRI functional (fMRI) head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	2	1	1	0	0	0	0	0
MRI head perfusion with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	2	1	0	0	0	1	0	0
MR spectroscopy head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	2	1	0	0	0	0
MRI complete spine without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	3	0	0	0	0	0	0
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv	���� 3- 10 mSv [ped]	1	1	13	1	0	0	2	0	1	0	0
MRI head without IV contrast with DTI	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	2	0	0	2	1	0	0	0
MRI complete spine with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	1	0	0	1	0	0	1
MRI head with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	3	1	0	0	0	0	0	0
MRI head perfusion without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	1	0	2	0	0	0	0
Fluciclovine PET/CT brain	Usually not appropriate	Expert Consensus	���⊕ 10-30 mSv		1	1	14	1	0	1	0	1	0	0	0
DOTATATE PET/CT brain	Usually not appropriate	Limited	<b>≎≎≎</b> 1-10 mSv		1	1	11	3	2	0	0	0	0	0	0

References	Study Quality
11 (35854930)	4

FDG-PET/MRI brain	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	13	1	0	0	2	0	1	0	0
Fluciclovine PET/MRI brain	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	14	1	0	1	0	1	0	0	0
DOTATATE PET/MRI brain	Usually not appropriate	Limited	��� 1-10 mSv		1	1	11	3	2	0	0	0	0	0	0
		Pafarancas		Study	, Quality										

 References
 Study Quality

 11 (35854930)
 4

Variant 3: Adult. Suspected intra-axial brain tumor based on prior imaging. Pretreatment evaluation.

Duo oo duuo	Appropriateness	SOE	A Julka DDI	Doda DDI	Datina	Madian			I	inal	Tabu	latio	ns		
Procedure	Category	SUE	Adults RRI	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	1	1	1	12
		References		Study	Quality										
		33 (28486641)			4										
		52 (36381650)			4										
		53 (33802292)			4										
		54 (26250565)			4										
		55 (36334295)			1										
		56 (32048719)			4										
MRI head perfusion with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	5	3	6	2	0
		References		Study	Quality										
		44 (30777220)			2										
		45 (31371360)			2										
		46 (37010573)			2										
		47 (29098571)			1										
		48 (32678438)			2										

		49 (37246748)			2										
		50 (36549990)			2										
		51 (37105676)			2										
MRI functional (fMRI) head without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	2	6	3	2	2	1
		References		Study	Quality										
		4 (34060940)		C	Good										
		42 (32653026)			2										
		43 (28980887)		C	Good		<u> </u>								
MRI head without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	1	0	0	2	4	5	2	2	0
		References		Study	Quality										
		33 (28486641)			4										
		57 (35198981)		C	Good										
		58 (28751449)			2										
		59 (37468750)			1			1							
MRI head without IV contrast with DTI	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	4	7	3	0	2
		References		Study	Quality										
		2 (31494311)			2										
		3 (31192130)			4										
		60 (35626069)			4										
		61 (30277427)			2								ı		
MRI head perfusion without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	7	4	5	0	0
		References		Study	Quality										
		44 (30777220)			2										
		45 (31371360)			2										
		46 (37010573)			2										
		47 (29098571)			1		_								
		48 (32678438)			2										

49 (37246748)	)		2										
			<u> </u>										
50 (36549990)	)		2										
51 (37105676)			2										
Strong	O 0 mSv	O 0 mSv [ped]	5	5	1	0	0	4	6	2	2	1	0
References		Study	Quality										
38 (35655732)	)		4										
39 (29459844)	)		4										
40 (26471274)	)	C	Good										
41 (33811494)	)	C	Good										
Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	1	0	1	12	2	0	0	0
Strong	���� 10-30 mSv		5	5	0	1	0	5	8	2	0	0	0
References		Study	Quality										
8 (36549916)			2										
9 (37341842)			1										
35 (30519867)	)		4										
37 (29730279)			2										
Strong	��� 1-10 mSv		5	5	0	1	0	4	9	2	0	0	0
References		Study	Quality								•		
8 (36549916)			2										
9 (37341842)			1										
35 (30519867)	)		4										
37 (29730279)	)		2										
Limited	��� 1-10 mSv		2	2	7	3	4	1	1	0	0	0	0
References		Study	Quality										
35 (30519867)	\		4										
33 (30319807)	)		7										
	51 (37105676) Strong  References 38 (35655732) 39 (29459844) 40 (26471274) 41 (33811494) Expert Consensus  Strong  References 8 (36549916) 9 (37341842) 35 (30519867) 37 (29730279)  Strong  References 8 (36549916) 9 (37341842) 35 (30519867) 37 (29730279) Limited  References	Strong       O 0 mSv         References       38 (35655732)         39 (29459844)       40 (26471274)         41 (33811494)       Expert Consensus         Strong       \$\phi \phi \phi \phi \phi\$         References       8 (36549916)         9 (37341842)       35 (30519867)         37 (29730279)       \$\phi \phi \phi\$         References       8 (36549916)         9 (37341842)       35 (30519867)         37 (29730279)       \$\phi \phi \phi\$         Limited       \$\phi \phi \phi\$         References       \$\phi \phi \phi \phi\$         References       \$\phi \phi \phi \phi \phi\$         9 (37341842)       35 (30519867)         37 (29730279)       \$\phi \phi \phi \phi \phi \phi \phi \phi	Strong     O 0 mSv [ped]       References     Study       38 (35655732)     Study       39 (29459844)     (26471274)       40 (26471274)     (274)       41 (33811494)     (374)       Expert Consensus     O 0 mSv [ped]       Strong     Study       References     Study       8 (36549916)     Study       9 (37341842)     Study       37 (29730279)     Strong       References     Study       8 (36549916)     Study       9 (37341842)     Study       35 (30519867)     Study       37 (29730279)     Limited       Limited     Study       References     Study	Strong         O 0 mSv         O 0 mSv [ped]         5           References         Study Quality         38 (35655732)         4           39 (29459844)         4         4           40 (26471274)         Good         Good           41 (33811494)         Good         Good           Expert Consensus         O 0 mSv [ped]         5           Strong         Study Quality         5           References         Study Quality           8 (36549916)         2         2           9 (37341842)         1         35 (30519867)         4           37 (29730279)         2         5           References         Study Quality         8 (36549916)         2         9 (37341842)         1           9 (37341842)         1         2         35 (30519867)         4         37 (29730279)         2           Limited         \$\Psi \Psi \Psi \Psi \square         1-10 mSv         2         2           References         Study Quality         2	Strong     O 0 mSv     O 0 mSv [ped]     5       References     Study Quality       38 (35655732)     4       39 (29459844)     4       40 (26471274)     Good       41 (33811494)     Good       Expert Consensus     O 0 mSv [ped]     5       Strong     \$\phi \phi \phi \phi \phi \phi \phi \phi	Strong         O 0 mSv         O 0 mSv [ped]         5         5         1           References         Study Quality         38 (35655732)         4	Strong     O 0 mSv     O 0 mSv [ped]     5     5     1     0       References     Study Quality       38 (35655732)     4       39 (29459844)     4     4       40 (26471274)     Good       41 (33811494)     Good       Expert Consensus     O 0 mSv [ped]     5     5     0     1       Strong     \$\phi \phi \phi \phi \phi \phi \phi \phi	Strong         O 0 mSv         O 0 mSv [ped]         5         5         1         0         0           References         Study Quality         38 (35655732)         4         39 (29459844)         4         4         4         40 (26471274)         Good         4 (33811494)         Good         5         5         0         1         0         0         0 mSv [ped]         5         5         0         1         0           Strong         Expert Consensus         O 0 mSv [ped]         5         5         0         1         0           Strong         Strong mSv         5         5         0         1         0           References         Study Quality         8 (36549916)         2         2         9 (37341842)         1         3         37 (29730279)         2         7         3         4           References         Study Quality         8 (36549916)         2         2         7         3         4           References         Study Quality         2         2         7         3         4           References         Study Quality         2         2         7         3         4           References         St	Strong	Strong	Strong     O 0 mSv     O 0 mSv [ped]     5     5     1     0     0     4     6     2       References     Study Quality       38 (35655732)     4       39 (29459844)     4       40 (26471274)     Good       41 (33811494)     Good       Expert Consensus     O 0 mSv     O 0 mSv [ped]     5     5     0     1     0     1     12     2       Strong     ★★★ 10-30 mSv     5     5     0     1     0     5     8     2       References     Study Quality       8 (36549916)     2       9 (37341842)     1       37 (29730279)     2       References     Study Quality       8 (36549916)     2       9 (37341842)     1       35 (30519867)     4       37 (29730279)     2       Limited     ★★★ 1-10 mSv     2     2     7     3     4     1     1     0       References     Study Quality	Strong	Strong

DOTATATE PET/MRI brain	Usuall approp	Limited	��� 1-10 mSv	0	2	2	8	4	4	0	0	0	0	0	0
		References		Study	Quality										
		34 (35695763)			4										
CT head with IV contrast	Usuall approp	Expert Consensus	<b>���</b> 1-10 mSv	0	1	1	12	3	1	0	0	0	0	0	0
CT head without IV contrast	Usuall approp	Expert Consensus	Consensus         mSv         3 mSv         1 ped]           Expert         \$3 mSv         1-10         \$3 mSv         1 mSv         1				12	1	2	2	0	0	0	0	0
CT head without and with IV contrast	Usuall approp				1	1	12	3	1	0	0	0	0	0	0
MRI complete spine without IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	1	3	0	1	0	1	0	0
FDG-PET/CT brain	Usuall approp	Limited	��� 1-10 mSv	0	1	1	9	3	3	1	0	0	0	0	0
		References		Study	Quality		-								
		35 (30519867)			4										
		36 (31426864)			2					_					
MRI complete spine with IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	0	0	1	0	0	1
MRI head with IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	2	0	0	1	0	0	0
DOTATATE PET/CT brain	Usuall approp	Limited	��� 1-10 mSv	0	1	1	9	4	3	0	0	0	0	0	0
		References		Study	/ Quality										
		34 (35695763)			4										

Variant 4: Adult. Suspected extra-axial brain tumor on prior imaging. Pretreatment evaluation.

Procedure	Appropriatene	SOE SOE	Adults RRL	Peds RRL	Datina	Median			F	inal	Tabu	latio	ns		
Procedure	Category	SUE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	1	0	0	0	2	1	12
		References		Study	Quality										
		62 (33459822)	)		4										
		63 (27432671)			4										
DOTATATE PET/CT brain	May be appropriate	Strong	��� 1-10 mSv		6	6	0	0	1	1	4	6	3	1	0
		References		Study	Quality										
		68 (28450556)	)		2										
		65 (35275019)	)		2										
		66 (35885570)	1		4										
		67 (37287577)	)		4										
		69 (32442855)			4		_								
DOTATATE PET/MRI brain	May be appropriate	Strong	��� 1-10 mSv		6	6	0	0	1	1	5	5	3	1	0
		References		Study	Quality										
		68 (28450556)	)		2										
		65 (35275019)	)		2										
		66 (35885570)	)		4										
		67 (37287577)	)		4										
		69 (32442855)			4						1				
MRI head without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	0	1	14	0	0	0	0
		References		Study	Quality										
		32 (32065345)			4										
		62 (33459822)			4										
		63 (27432671)			4										

MRI complete spine without and with IV contrast	May l appropr	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	1	1	7	6	0	0	0
		References		Study	Quality										
		64 (37535461)			4										
MRI functional (fMRI) head without IV contrast	May l appropr	Limited	O 0 mSv	O 0 mSv [ped]	4	4	3	1	2	4	4	1	0	1	0
		References		Study	Quality		•				•		•	•	
		70 (25957723)			2										
CT head without IV contrast	Usually appropr	Limited	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	3	3	5	3	4	3	1	0	0	0	0
		References		Study	Quality						•				
		62 (33459822)	322) 4												
		62 (33459822) 63 (27432671)			4										
MRI head perfusion with IV contrast	Usually appropr	Limited	O 0 mSv	O 0 mSv [ped]	3	3	5	1	3	1	6	0	0	0	0
		References		Study	Quality						•				
		71 (33504729)			4										
		72 (35155210)			2										
MRI head without IV contrast with DTI	Usually appropr	Limited	O 0 mSv	O 0 mSv [ped]	3	3	5	1	3	0	6	1	0	0	0
		References		Study	Quality			•	•		•				
		70 (25957723)			2										
MRI head perfusion without IV contrast	Usually appropr	Limited	O 0 mSv	O 0 mSv [ped]	3	3	5	1	4	3	3	0	0	0	0
		References		Study Quality											
		71 (33504729)		4											
		72 (35155210)		2											
CT head with IV contrast	Usually appropr	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	2	2	0	0	0	0	0	0

CT head without and with IV contrast	Usually not appropriate	Expert Consensus	≎⊛⊛ 1-10 mSv	<b>≎≎≎≎</b> 3- 10 mSv [ped]	1	1	12	2	2	0	0	0	0	0	0
MR spectroscopy head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	0	2	0	0	0	0
MRI complete spine without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	2	0	1	0	0	0	0
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	3	1	0	0	2	0	0	0
MRI complete spine with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	1	1	1	1	0	0	0	1
MRI head with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
Fluciclovine PET/CT brain	Usually not appropriate	Expert Consensus	���� 10-30 mSv		1	1	11	2	2	0	0	1	0	0	0
FDG-PET/MRI brain	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	11	2	1	0	0	2	0	0	0
Fluciclovine PET/MRI brain	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv		1	1	11	2	2	0	0	1	0	0	0

Variant 5: Adult. Known history of brain tumor. Posttreatment surveillance.

D 1	Appropriateness	COF	A L L DDI	D I DDI	D. (	3.7.11			F	inal '	Гаbи	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	0	2	0	13

References	Study Quality
33 (28486641)	4
53 (33802292)	4
54 (26250565)	4

		55 (36334295)			1										
		56 (32048719)			4										
		62 (33459822)			4										
		63 (27432671)			4			1		1	1				
MRI head perfusion with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	4	4	4	3	1
		References		Study	Quality										
		76 (27502247)		C	lood										
		48 (32678438)			2										
		54 (26250565)			4										
		56 (32048719)			4										
		71 (33504729)		4											
		72 (35155210)		2											
MRI head perfusion without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	7	4	1	4	0
		References		Study	Quality										
		76 (27502247)		C	lood										
		48 (32678438)			2										
		54 (26250565)			4										
		56 (32048719)			4										
		71 (33504729)			4										
		72 (35155210)			2	_									
MRI head without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	2	1	0	2	3	7	0	1	0
		References		Study	Quality										
		54 (26250565)			4										
		56 (32048719)			4										
		62 (33459822)			4										
		63 (27432671)			4										

MRI complete spine without and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	2	0	1	4	7	1	1	0	0
DOTATATE PET/MRI brain	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv		3	3	7	1	6	1	1	0	0	0	0
DOTATATE PET/CT brain	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv		2	2	7	2	6	1	0	0	0	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
CT head without IV contrast	Usually not appropriate	Expert Consensus	<b>≎≎≎</b> 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	1	2	0	1	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
MRI functional (fMRI) head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	0	1	2	0	0	0	0
MR spectroscopy head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	4	1	0	0	0	0	0	0
MRI complete spine without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	4	0	0	1	0	0	0	0
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	4	2	0	0	0	0	0	0
MRI head without IV contrast with DTI	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	0	0	2	1	0	0	0
MRI complete spine with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	2	1	1	2	0	0	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	3	1	0	0	0	0	0	0
Fluciclovine PET/CT brain	Usually not appropriate	Expert Consensus	���� 10-30 mSv		1	1	10	3	3	0	0	0	0	0	0

FDG-PET/MRI brain	Usually not appropriate	Expert Consensus	��� 1-10 mSv	1	1	10	4	2	0	0	0	0	0	0
Fluciclovine PET/MRI brain	Usually not appropriate	Expert Consensus	��� 1-10 mSv	1	1	10	3	3	0	0	0	0	0	0

# Variant 6: Adult. Known history of brain tumor. New or enlarging lesion on posttreatment surveillance. Next imaging study.

	Appropriateness	GOF.	A L L DDI	D I DDI	D 41	3.6.19			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	1	0	0	0	2	2	11
		References		Study	y Quality										
		74 (37774317)			4								_	_	
MRI head perfusion with IV contrast	Usually appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	2	0	8	4	1
		References         Study Qu           76 (27502247)         Good			y Quality										
					Good										
		1 (28332014)			4										
		1 (28332014) 4 80 (27187209) 4													
MRI head perfusion without IV contrast	Usually appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	3	2	7	2	1
		References		Study	y Quality		•								
		76 (27502247)		C	Good										
		1 (28332014)			4										
		80 (27187209)			4								_		
FDG-PET/CT brain	May be appropriate	Strong	<b>999</b> 1-10 mSv	���� 3- 10 mSv [ped]	6	6	0	0	0	2	6	3	5	0	0
		References		Study	y Quality										
		76 (27502247)		(	Good										
		7 (28341716)			2										

		35 (30519867)			4										
DOTATATE PET/CT brain	May be appropriate	Strong	��� 1-10 mSv		6	6	0	0	1	1	6	4	3	1	0
		References		Study	Quality										
		15 (35661809)			2										
		11 (35854930)			4										
		66 (35885570)			4										
		69 (32442855)			4										
		77 (31868239)			2										
		78 (31898311)			4										
FDG-PET/MRI brain	May be appropriate	Strong	��� 1-10 mSv		6	6	0	0	0	2	6	3	5	0	0
		References		Study	Quality			•			•	•			
		76 (27502247)			Good										
		7 (28341716)			2										
		35 (30519867)			4										
DOTATATE PET/MRI brain	May be appropriate	Strong	<b>≎≎≎</b> 1-10 mSv		6	6	0	0	1	1	6	4	3	1	0
		References		Study	Quality		•	•			•				
		15 (35661809)			2										
		11 (35854930)			4										
		66 (35885570)			4										
		69 (32442855)			4										
		77 (31868239)			2										
		78 (31898311)			4										
MRI head without IV contrast	May be appropriate	May be appropriate Limited O 0	O 0 mSv	O 0 mSv [ped]	5	5	0	1	0	4	9	2	0	0	0
		References		Study	Quality										
		54 (26250565)			4										
		56 (32048719)			4										

MR spectroscopy head without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	1	7	4	2	1	0
		References		Study	Quality										
		1 (28332014)			4										
MRI head without IV contrast with DTI	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	1	1	1	5	8	0	0	0	0
		References		Study	Quality										
		81 (26450533)			2										
		40 (26471274)		C	Good										
Fluciclovine PET/CT brain	Usually not appropriate	Limited	���� 10-30 mSv		3	3	5	1	3	2	4	1	0	0	0
		References		Study	Quality										
		10 (37055222)		4 4											
		79 (36577872)		4 4											
Fluciclovine PET/MRI brain	Usually not appropriate	Limited	��� 1-10 mSv		3	3	5	1	3	2	4	1	0	0	0
		References		Study	Quality										
		10 (37055222)		_	4										
		79 (36577872)			4										
CT head with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
CT head without IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	1	1	2	0	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
MRI functional (fMRI) head without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	0	1	1	1	0	0	0
MRI complete spine without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	1	0	1	0	0	0	0

MRI complete spine without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	0	1	0	1	0	0
MRI complete spine with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	1	0	0	0	1	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	2	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.