

American College of Radiology
ACR Appropriateness Criteria®

Movement Disorders and Neurodegenerative Diseases

Variant 1: Rapidly progressive dementia; suspected Creutzfeldt-Jakob disease. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	1	0	0	1	1	1	4	6
		References		Study Quality											
		8 (16908558)		3											
		14 (15958503)		2											
		10 (13679271)		3											
		6 (20430851)		2											
		11 (22499277)		4											
		7 (19755520)		1											
		12 (15304574)		2											
		13 (17569970)		2											
		15 (15956529)		2											
		16 (25367029)		4											
		17 (27942451)		2											
		9 (28076012)		4											
		MRI head without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	0	7
		References		Study Quality											
		8 (16908558)		3											
		14 (15958503)		2											

10 (13679271)	3
6 (20430851)	2
11 (22499277)	4
7 (19755520)	1
12 (15304574)	2
13 (17569970)	2
15 (15956529)	2
16 (25367029)	4
17 (27942451)	2
9 (28076012)	4

CT head without IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	5	5	0	0	1	0	11	3	0	0	0
FDG-PET/CT brain	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	1	1	2	5	5	0	0	0	0

References	Study Quality
4 (12483414)	2
5 (8414042)	4

SPECT or SPECT/CT brain perfusion	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
18 (16769939)	4
19 (22050286)	3

SPECT or SPECT/CT brain perfusion	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	1	0	1	12	1	0	0	0	0
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References	Study Quality
18 (16769939)	4
19 (22050286)	3

MR spectroscopy head without IV contrast	Usually not appropriate	Strong	0 0 mSv	0 0 mSv [ped]	3	3	2	1	5	3	2	0	1	0	0
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		References		Study Quality											
		6 (20430851)		2											
		7 (19755520)		1											
CT head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	7	3	2	1	0	1	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	8	3	0	0	1	1	1	0	0
MRI functional (fMRI) head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	2	0	0	0	0	1	0	0

Variant 2: Chorea; suspected Huntington disease. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Strong	○ ○ mSv	○ ○ mSv [ped]	9	9	0	1	0	0	0	0	3	0	10
		References		Study Quality											
		22 (9040728)		4											
		23 (8929153)		2											
		24 (1531910)		2											
		25 (8418795)		4											
		26 (18096682)		2											
		27 (11889230)		2											
		28 (19646924)		2											
MRI head without and with IV contrast	May be appropriate	Strong	○ ○ mSv	○ ○ mSv [ped]	6	6	0	1	0	2	2	9	0	1	0
		References		Study Quality											
		22 (9040728)		4											
		23 (8929153)		2											

SPECT or SPECT/CT brain perfusion	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	10	3	0	0	0	0	1	0	0
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Variant 4: Suspected neurodegeneration with brain iron accumulation. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	9	9	0	1	0	0	0	0	2	2	9

References	Study Quality
70 (12510040)	4
71 (21920862)	4
69 (16775270)	4
72 (18443312)	4
73 (15944911)	4
74 (19850762)	2

MRI head without and with IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	5	5	0	1	0	3	7	1	3	0	0
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References	Study Quality
70 (12510040)	4
71 (21920862)	4
69 (16775270)	4
72 (18443312)	4
73 (15944911)	4
74 (19850762)	2

CT head without IV contrast	May be appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	4	4	0	0	1	10	3	1	0	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	11	0	1	0	0	1	1	0	0

CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	1	0	0	0	1	1	0	0
MRI functional (fMRI) head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	2	0	0	0	0	0	0	1
MR spectroscopy head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	2	0	0	0	0	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	2	0	0	0	0	1	0	0
SPECT or SPECT/CT brain perfusion	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
SPECT or SPECT/CT brain perfusion	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	1	1	0	0	0	0	0	1

Variant 5: Suspected motor neuron disease. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	9	9	0	1	0	0	1	0	3	0	9

References	Study Quality
76 (16324086)	4
77 (9344001)	3
78 (7997565)	2
79 (3382182)	4
80 (11412870)	2
81 (12084444)	2
82 (27995062)	2
83 (22529995)	1
84 (17296988)	2

		85 (25971894)			4												
MRI head without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	1	0	0	1	3	4	4	0	1		
		References		Study Quality													
		76 (16324086)		4													
		77 (9344001)		3													
		78 (7997565)		2													
		79 (3382182)		4													
		80 (11412870)		2													
		81 (12084444)		2													
		82 (27995062)		2													
		83 (22529995)		1													
		84 (17296988)		2													
		85 (25971894)		4													
MRI spine without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	1	0	1	1	3	7	0	1	1		
		References		Study Quality													
		89 (24847978)		4													
		90 (24219347)		2													
		91 (29122760)		3													
		88 (22435076)		4													
		87 (28586096)		2													
		86 (29379040)		2													
CT head without IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 0.3-3 mSv [ped]	4	4	0	1	2	9	2	1	0	0	0		
MRI spine without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	3	1	0	7	2	2	0	0	0		
		References		Study Quality													
		89 (24847978)		4													
		90 (24219347)		2													

91 (29122760)	3
88 (22435076)	4
87 (28586096)	2
86 (29379040)	2

CT head with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	10	0	2	0	0	2	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	11	1	0	0	0	1	1	0	0
CT spine with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	12	0	0	0	1	0	1	0	0
CT spine without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	10	0	1	1	1	0	0	1	0
CT spine without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	11	0	1	0	1	0	0	1	0
MRI functional (fMRI) head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	1	1	1	0	0	0	0	1
MR spectroscopy head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	1	1	0	0	1	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	10	2	1	0	0	0	1	0	0
SPECT or SPECT/CT brain perfusion	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
SPECT or SPECT/CT brain perfusion	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	10	2	1	0	0	0	0	0	1

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.