

American College of Radiology
ACR Appropriateness Criteria®

Dementia

Variant 1: Adult. Mild cognitive impairment not meeting criteria for dementia. 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 | 0 0 mSv | 0 0 mSv [ped] | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 8 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 11 (16880360) | | 4 | | | | | | | | | | | |
| | | 22 (19460794) | | 3 | | | | | | | | | | | |
| | | 25 (23954175) | | 3 | | | | | | | | | | | |
| | | 24 (21969707) | | 3 | | | | | | | | | | | |
| | | 23 (20139996) | | 4 | | | | | | | | | | | |
| | | 13 (18631949) | | 4 | | | | | | | | | | | |
| CT head without IV contrast | Usually appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | ☹☹☹ 0.3-3 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 0 | 1 | 2 | 8 | 3 | 2 |
| FDG-PET/CT brain | Usually appropriate | Strong | ☹☹☹ 1-10 mSv | ☹☹☹☹ 3-10 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 1 | 3 | 0 | 10 | 0 | 2 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 11 (16880360) | | 4 | | | | | | | | | | | |
| | | 12 (18287270) | | 3 | | | | | | | | | | | |
| | | 13 (18631949) | | 4 | | | | | | | | | | | |
| | | 14 (32734458) | | 1 | | | | | | | | | | | |
| | | 15 (34252877) | | 1 | | | | | | | | | | | |
| | | 9 (31628215) | | 1 | | | | | | | | | | | |

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|--------------------------------------|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|
| CT head with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼ 0.3-3 mSv [ped] | 1 | 1 | 13 | 1 | 1 | 1 | 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 | 13 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| SPECT or SPECT/CT brain striatal | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 11 | 2 | 3 | 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 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

Variant 2: Adult. Cognitive impairment with memory deficits. Suspect Alzheimer disease with typical clinical presentation. 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 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 9 |

| References | Study Quality |
|---------------|---------------|
| 46 (24331205) | 1 |
| 24 (21969707) | 3 |
| 23 (20139996) | 4 |
| 13 (18631949) | 4 |
| 47 (29762090) | 2 |
| 28 (31917652) | 4 |

| | | | | | | | | | | | | | | | |
|----------------------|---------------------|--------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|
| Amyloid PET/CT brain | Usually appropriate | Strong | ☼☼☼ 1-10 mSv | | 8 | 8 | 0 | 0 | 0 | 0 | 3 | 2 | 1 | 6 | 4 |
|----------------------|---------------------|--------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|---------------|---------------|
| 38 (25988463) | Good |
| 34 (14991808) | 3 |
| 33 (21245183) | 2 |
| 37 (20501908) | 3 |

| | |
|---------------|---|
| 3 (21764791) | 2 |
| 25 (23954175) | 3 |
| 7 (29889941) | 2 |
| 35 (32385166) | 2 |
| 36 (32808011) | 3 |
| 42 (33219525) | 1 |
| 6 (29018162) | 2 |
| 31 (35649652) | 4 |
| 8 (30915522) | 2 |
| 40 (37561943) | 2 |
| 41 (29962497) | 2 |
| 39 (30094462) | 1 |
| 28 (31917652) | 4 |

| | | | | | | | | | | | | | | | |
|------------------|---------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| FDG-PET/CT brain | Usually appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 1 | 3 | 1 | 8 | 1 | 2 |
|------------------|---------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|---------------|---------------|
| 11 (16880360) | 4 |
| 45 (11342678) | 4 |
| 12 (18287270) | 3 |
| 44 (11801698) | 3 |
| 14 (32734458) | 1 |
| 28 (31917652) | 4 |

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|-----------------------------|--------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT head without IV contrast | May be appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕ 0.3-3 mSv [ped] | 6 | 6 | 0 | 0 | 0 | 1 | 2 | 7 | 4 | 1 | 1 |
|-----------------------------|--------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|--------------|---------------|
| 43 (2105589) | 4 |

| | | | | | | | | | | | | | | | |
|------------------|--------------------|--------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|
| Tau PET/CT brain | May be appropriate | Strong | ⊕⊕⊕ 1-10 mSv | | 6 | 6 | 0 | 0 | 2 | 0 | 4 | 4 | 5 | 1 | 0 |
|------------------|--------------------|--------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|---------------|---------------|
| 53 (30326496) | 2 |

| | | | | | | | | | | | | | | | |
|--------------------------------------|-------------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT head without and with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 8 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |
|--------------------------------------|-------------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|

Variant 3: Adult. Cognitive impairment with memory deficits. Suspect Alzheimer disease with atypical clinical presentation. 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 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 9 |

| References | Study Quality |
|---------------|---------------|
| 46 (24331205) | 1 |
| 24 (21969707) | 3 |
| 23 (20139996) | 4 |
| 13 (18631949) | 4 |
| 47 (29762090) | 2 |
| 28 (31917652) | 4 |
| 59 (31672482) | 3 |

| | | | | | | | | | | | | | | | |
|----------------------|---------------------|--------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|
| Amyloid PET/CT brain | Usually appropriate | Strong | ☼☼☼ 1-10 mSv | | 9 | 9 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 7 |
|----------------------|---------------------|--------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|---------------|---------------|
| 34 (14991808) | 3 |
| 33 (21245183) | 2 |
| 37 (20501908) | 3 |
| 3 (21764791) | 2 |
| 25 (23954175) | 3 |
| 7 (29889941) | 2 |
| 5 (38306055) | 2 |
| 35 (32385166) | 2 |
| 42 (33219525) | 1 |
| 6 (29018162) | 2 |

| | | | | | | | | | | | | | | | | | | | | |
|--|-------------------------|------------------|---------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|
| | | | References | Study Quality | | | | | | | | | | | | | | | | |
| | | | 45 (11342678) | 4 | | | | | | | | | | | | | | | | |
| | | | 49 (18855165) | 3 | | | | | | | | | | | | | | | | |
| | | | 48 (9527139) | 2 | | | | | | | | | | | | | | | | |
| SPECT or SPECT/CT brain striatal | May be appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 4 | 4 | 7 | 0 | 1 | 1 | 6 | 1 | 0 | 0 | 0 | | | | | |
| | | References | Study Quality | | | | | | | | | | | | | | | | | |
| | | 50 (20075101) | 3 | | | | | | | | | | | | | | | | | |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Limited | O O mSv | O O mSv [ped] | 3 | 3 | 5 | 1 | 4 | 0 | 2 | 1 | 0 | 0 | 0 | | | | | |
| | | References | Study Quality | | | | | | | | | | | | | | | | | |
| | | 19 (21807094) | 4 | | | | | | | | | | | | | | | | | |
| | | 21 (22189566) | 3 | | | | | | | | | | | | | | | | | |
| MRI head without and with IV contrast | Usually not appropriate | Expert Consensus | O O mSv | O O mSv [ped] | 3 | 3 | 3 | 4 | 6 | 1 | 2 | 0 | 0 | 0 | 0 | | | | | |
| MR spectroscopy head without IV contrast | Usually not appropriate | Limited | O O mSv | O O mSv [ped] | 3 | 3 | 5 | 2 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| | | References | Study Quality | | | | | | | | | | | | | | | | | |
| | | 16 (16443495) | 4 | | | | | | | | | | | | | | | | | |
| | | 17 (18445744) | 4 | | | | | | | | | | | | | | | | | |
| CT head with IV contrast | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕ 0.3-3 mSv [ped] | 1 | 1 | 8 | 1 | 0 | 0 | 2 | 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 | 8 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | | | | | |

[illegible]

| 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 | 0 0 mSv | 0 0 mSv [ped] | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 11 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 62 (37357276) | | 4 | | | | | | | | | | | |
| Amyloid PET/CT brain | Usually appropriate | Limited | ☹☹☹ 1-10 mSv | | 9 | 9 | 0 | 0 | 1 | 0 | 3 | 0 | 1 | 1 | 7 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 62 (37357276) | | 4 | | | | | | | | | | | |
| | | 10 (-3198414) | | 4 | | | | | | | | | | | |
| Tau PET/CT brain | May be appropriate | Limited | ☹☹☹ 1-10 mSv | | 4 | 4 | 0 | 1 | 5 | 3 | 4 | 3 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 62 (37357276) | | 4 | | | | | | | | | | | |
| | | 10 (-3198414) | | 4 | | | | | | | | | | | |
| MRI head without and with IV contrast | Usually not appropriate | Expert Consensus | 0 0 mSv | 0 0 mSv [ped] | 3 | 3 | 7 | 1 | 7 | 1 | 0 | 0 | 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 | 0 | 1 | 0 | 0 |
| CT head without IV contrast | Usually not appropriate | Limited | ☹☹☹ 1-10 mSv | ☹☹☹ 0.3-3 mSv [ped] | 1 | 1 | 7 | 0 | 1 | 2 | 2 | 1 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 62 (37357276) | | 4 | | | | | | | | | | | |
| CT head without and with IV contrast | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | ☹☹☹☹ 3-10 mSv [ped] | 1 | 1 | 11 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Expert Consensus | 0 0 mSv | 0 0 mSv [ped] | 1 | 1 | 11 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | |
|--|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|
| MR spectroscopy head without IV contrast | Usually not appropriate | Expert Consensus | 0.0 mSv | 0.0 mSv [ped] | 1 | 1 | 11 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| SPECT or SPECT/CT brain striatal | Usually not appropriate | Expert Consensus | ☢☢☢ 1-10 mSv | ☢☢☢☢ 3-10 mSv [ped] | 1 | 1 | 9 | 1 | 2 | 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 | 1 | 9 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 |
| FDG-PET/CT brain | Usually not appropriate | Expert Consensus | ☢☢☢ 1-10 mSv | ☢☢☢☢ 3-10 mSv [ped] | 1 | 1 | 8 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |

Variant 5: Adult. Known Alzheimer disease undergoing therapy with anti-amyloid monoclonal antibodies. Posttreatment 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 | 0 0 mSv | 0 0 mSv [ped] | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 11 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 63 (37651273) | | 4 | | | | | | | | | | | |
| Amyloid PET/CT brain | May be appropriate (Disagreement) | Expert Opinion | ☹☹☹ 1-10 mSv | | 5 | 5 | 8 | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 1 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 67 (37639461) | | 4 | | | | | | | | | | | |
| | | 66 (37459141) | | 1 | | | | | | | | | | | |
| | | 10 (-3198414) | | 4 | | | | | | | | | | | |
| CT head with IV contrast | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | ☹☹☹ 0.3-3 mSv [ped] | 1 | 1 | 11 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| CT head without IV contrast | Usually not appropriate | Limited | ☹☹☹ 1-10 mSv | ☹☹☹ 0.3-3 mSv [ped] | 1 | 1 | 9 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |

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|---------------------------------------|-------------------------|------------------|---------------|---------------------|---|---|---|---|---|---|----|---|---|---|---|--|--|
| | | | 75 (22976075) | 3 | | | | | | | | | | | | | |
| | | | 74 (37500561) | 2 | | | | | | | | | | | | | |
| | | | 28 (31917652) | 4 | | | | | | | | | | | | | |
| | | | 73 (38012398) | 3 | | | | | | | | | | | | | |
| FDG-PET/CT brain | Usually appropriate | Limited | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 8 | 8 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 2 | 5 | | |
| | | References | Study Quality | | | | | | | | | | | | | | |
| | | 11 (16880360) | 4 | | | | | | | | | | | | | | |
| | | 68 (33402272) | 4 | | | | | | | | | | | | | | |
| | | 28 (31917652) | 4 | | | | | | | | | | | | | | |
| CT head without IV contrast | Usually appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼ 0.3-3 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 1 | 0 | 0 | 9 | 3 | 3 | | |
| Amyloid PET/CT brain | May be appropriate | Limited | ☼☼☼ 1-10 mSv | | 5 | 5 | 0 | 0 | 1 | 1 | 13 | 0 | 1 | 0 | 0 | | |
| | | References | Study Quality | | | | | | | | | | | | | | |
| | | 3 (21764791) | 2 | | | | | | | | | | | | | | |
| | | 70 (25171901) | 4 | | | | | | | | | | | | | | |
| SPECT or SPECT/CT brain perfusion | May be appropriate | Limited | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 4 | 4 | 1 | 1 | 1 | 6 | 6 | 1 | 0 | 0 | 0 | | |
| | | References | Study Quality | | | | | | | | | | | | | | |
| | | 48 (9527139) | 2 | | | | | | | | | | | | | | |
| MRI head without and with IV contrast | Usually not appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 3 | 3 | 6 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Tau PET/CT brain | Usually not appropriate | Strong | ☼☼☼ 1-10 mSv | | 3 | 3 | 7 | 1 | 6 | 1 | 1 | 0 | 0 | 0 | 0 | | |
| | | References | Study Quality | | | | | | | | | | | | | | |
| | | 53 (30326496) | 2 | | | | | | | | | | | | | | |
| | | 76 (30704514) | 2 | | | | | | | | | | | | | | |
| | | 77 (30594046) | 2 | | | | | | | | | | | | | | |
| | | 28 (31917652) | 4 | | | | | | | | | | | | | | |

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|--|-------------------------|------------------|---------------|---------------------|---------------|---|---|---|---|---|---|---|---|---|---|--|
| | | 78 (33824991) | | | 3 | | | | | | | | | | | |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Strong | 0 0 mSv | 0 0 mSv [ped] | 2 | 2 | 6 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | References | | | Study Quality | | | | | | | | | | | |
| | | 19 (21807094) | | | 4 | | | | | | | | | | | |
| | | 72 (25002573) | | | 2 | | | | | | | | | | | |
| | | 71 (12821731) | | | 2 | | | | | | | | | | | |
| MR spectroscopy head without IV contrast | Usually not appropriate | Limited | 0 0 mSv | 0 0 mSv [ped] | 2 | 2 | 6 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | References | | | Study Quality | | | | | | | | | | | |
| | | 17 (18445744) | | | 4 | | | | | | | | | | | |
| CT head with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼ 0.3-3 mSv [ped] | 1 | 1 | 8 | 1 | 0 | 1 | 1 | 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 | 8 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | |
| SPECT or SPECT/CT brain striatal | Usually not appropriate | Expert Consensus | ☼☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 9 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | |

Variant 7: Adult. Cognitive impairment with visual hallucinations or parkinsonian symptoms. Suspect dementia with Lewy bodies. Initial imaging.

| References | Study Quality |
|---------------|---------------|
| 83 (26572170) | 3 |
| 46 (24331205) | 1 |
| 85 (18692749) | 3 |
| 68 (33402272) | 4 |

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|--|-----------------------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| | | 28 (31917652) | | 4 | | | | | | | | | | | |
| | | 84 (36123123) | | 2 | | | | | | | | | | | |
| CT head without IV contrast | Usually appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕ 0.3-3 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 1 | 0 | 1 | 8 | 5 | 1 |
| SPECT or SPECT/CT brain striatal | Usually appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 5 | 2 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 50 (20075101) | | 3 | | | | | | | | | | | |
| | | 89 (32198310) | | 2 | | | | | | | | | | | |
| | | 88 (36920494) | | 4 | | | | | | | | | | | |
| | | 68 (33402272) | | 4 | | | | | | | | | | | |
| FDG-PET/CT brain | Usually appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 7 | 7 | 1 | 0 | 0 | 0 | 2 | 1 | 3 | 3 | 3 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 11 (16880360) | | 4 | | | | | | | | | | | |
| | | 79 (33926896) | | 4 | | | | | | | | | | | |
| | | 81 (37421880) | | 1 | | | | | | | | | | | |
| | | 68 (33402272) | | 4 | | | | | | | | | | | |
| MRI head without and with IV contrast | May be appropriate (Disagreement) | Expert Opinion | ○ ○ mSv | ○ ○ mSv [ped] | 5 | 5 | 4 | 2 | 3 | 1 | 1 | 0 | 3 | 2 | 0 |
| SPECT or SPECT/CT brain perfusion | May be appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕⊕ 3-10 mSv [ped] | 5 | 5 | 4 | 0 | 0 | 2 | 8 | 2 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 50 (20075101) | | 3 | | | | | | | | | | | |
| | | 86 (19142710) | | 3 | | | | | | | | | | | |
| | | 87 (38315966) | | 2 | | | | | | | | | | | |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Limited | ○ ○ mSv | ○ ○ mSv [ped] | 2 | 2 | 7 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |

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|--|-------------------------|------------------|---------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|--|
| | | | 19 (21807094) | | 4 | | | | | | | | | | | |
| | | | 21 (22189566) | | 3 | | | | | | | | | | | |
| MR spectroscopy head without IV contrast | Usually not appropriate | Limited | O 0 mSv | O 0 mSv [ped] | 2 | 2 | 7 | 2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | References | Study Quality | | | | | | | | | | | | | |
| | | 82 (24468473) | 3 | | | | | | | | | | | | | |
| | | 17 (18445744) | 4 | | | | | | | | | | | | | |
| Amyloid PET/CT brain | Usually not appropriate | Strong | ☼☼☼ 1-10 mSv | | 2 | 2 | 7 | 3 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | |
| | | References | Study Quality | | | | | | | | | | | | | |
| | | 38 (25988463) | Good | | | | | | | | | | | | | |
| | | 80 (23831180) | 4 | | | | | | | | | | | | | |
| | | 3 (21764791) | 2 | | | | | | | | | | | | | |
| CT head with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼ 0.3-3 mSv [ped] | 1 | 1 | 15 | 0 | 1 | 0 | 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 | |
| Tau PET/CT brain | Usually not appropriate | Strong | ☼☼☼ 1-10 mSv | | 1 | 1 | 11 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| | | References | Study Quality | | | | | | | | | | | | | |
| | | 61 (30615804) | 2 | | | | | | | | | | | | | |
| | | 90 (27654968) | 1 | | | | | | | | | | | | | |
| | | 91 (33631469) | 2 | | | | | | | | | | | | | |

Variant 8: Adult. Cognitive impairment with recent stroke or stepwise decline. Suspect vascular dementia. Initial imaging.

[illegible]

| Procedure | Appropriateness Category | SOE | Adults RRL | Peds RRL | Rating | Median | Final Tabulations | | | | | | | | |
|---------------------------------------|-----------------------------------|------------------|--------------|---------------------|--------|--------|-------------------|---|---|---|----|---|---|---|---|
| | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | | | | | | | | | | | | |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 97 (22135130) | | 4 | | | | | | | | | | | |
| | | 101 (24557016) | | 1 | | | | | | | | | | | |
| | | 100 (18436880) | | 2 | | | | | | | | | | | |
| | | 102 (35614521) | | 2 | | | | | | | | | | | |
| | | 92 (35678401) | | 4 | | | | | | | | | | | |
| | | 28 (31917652) | | 4 | | | | | | | | | | | |
| | | 94 (15729521) | | 4 | | | | | | | | | | | |
| CT head without IV contrast | May be appropriate (Disagreement) | Expert Opinion | ☹☹☹ 1-10 mSv | ☹☹☹ 0.3-3 mSv [ped] | 5 | 5 | 3 | 0 | 1 | 2 | 1 | 1 | 5 | 1 | 2 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 95 (8094895) | | 4 | | | | | | | | | | | |
| | | 92 (35678401) | | 4 | | | | | | | | | | | |
| CTA head and neck with IV contrast | May be appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | ☹☹☹☹ 3-10 mSv [ped] | 5 | 5 | 0 | 0 | 0 | 2 | 8 | 3 | 2 | 1 | 0 |
| MRA head without IV contrast | May be appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 5 | 5 | 0 | 1 | 0 | 1 | 11 | 1 | 2 | 0 | 0 |
| MRA neck without IV contrast | May be appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 5 | 5 | 0 | 1 | 0 | 5 | 8 | 1 | 1 | 0 | 0 |
| MRA neck without and with IV contrast | May be appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 5 | 5 | 0 | 1 | 0 | 5 | 8 | 1 | 1 | 0 | 0 |
| MRI head without and with IV contrast | Usually not appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 2 | 2 | 8 | 1 | 3 | 2 | 1 | 0 | 0 | 0 | 1 |
| Amyloid PET/CT brain | Usually not appropriate | Limited | ☹☹☹ 1-10 mSv | | 2 | 2 | 7 | 1 | 1 | 1 | 3 | 0 | 0 | 1 | 0 |

| | | | | | | | | | | | | | | | |
|------------------|-------------------------|------------------|--------------|--|---|---|----|---|---|---|---|---|---|---|---|
| Tau PET/CT brain | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | | 1 | 1 | 10 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
|------------------|-------------------------|------------------|--------------|--|---|---|----|---|---|---|---|---|---|---|---|

Variant 9: Adult. Cognitive impairment with gait disturbance or urinary incontinence. Suspect normal pressure hydrocephalus. 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 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 10 |

| References | Study Quality |
|----------------|---------------|
| 103 (26644048) | 4 |
| 104 (37898265) | 4 |

| | | | | | | | | | | | | | | | |
|-----------------------------|---------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT head without IV contrast | Usually appropriate | Limited | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕ 0.3-3 mSv [ped] | 7 | 7 | 1 | 0 | 0 | 0 | 2 | 1 | 5 | 2 | 3 |
|-----------------------------|---------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|----------------|---------------|
| 104 (37898265) | 4 |

| | | | | | | | | | | | | | | | |
|---------------------|--------------------|---------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|
| DTPA cisternography | May be appropriate | Limited | ⊕⊕⊕ 1-10 mSv | | 5 | 5 | 0 | 1 | 0 | 3 | 8 | 3 | 1 | 0 | 0 |
|---------------------|--------------------|---------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|

| References | Study Quality |
|----------------|---------------|
| 103 (26644048) | 4 |
| 106 (33395973) | 2 |

| | | | | | | | | | | | | | | | |
|---------------------------------------|-------------------------|------------------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|
| MRI head without and with IV contrast | Usually not appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 2 | 2 | 8 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
|---------------------------------------|-------------------------|------------------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | |
|--------------------------|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|
| CT head with IV contrast | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | ⊕⊕⊕ 0.3-3 mSv [ped] | 1 | 1 | 15 | 1 | 0 | 0 | 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 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|--------------------------------------|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | |
|--|-------------------------|------------------|---------|---------------|---|---|----|---|---|---|---|---|---|---|---|
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Expert Consensus | ○ ○ mSv | ○ ○ mSv [ped] | 1 | 1 | 11 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
|--|-------------------------|------------------|---------|---------------|---|---|----|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | |
|--|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|
| MR spectroscopy head without IV contrast | Usually not appropriate | Limited | 0 0 mSv | 0 0 mSv [ped] | 1 | 1 | 10 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 108 (20647518) | | 2 | | | | | | | | | | | |
| SPECT or SPECT/CT brain striatal | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 10 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 |
| SPECT or SPECT/CT brain perfusion | Usually not appropriate | Limited | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 8 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 103 (26644048) | | 4 | | | | | | | | | | | |
| FDG-PET/CT brain | Usually not appropriate | Limited | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 8 | 1 | 3 | 1 | 1 | 0 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 107 (29876274) | | 2 | | | | | | | | | | | |
| | | 105 (32906629) | | 4 | | | | | | | | | | | |
| Amyloid PET/CT brain | Usually not appropriate | Limited | ☼☼☼ 1-10 mSv | | 1 | 1 | 8 | 3 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 105 (32906629) | | 4 | | | | | | | | | | | |
| Tau PET/CT brain | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 10 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |

Variant 10: Adult. Rapidly progressive dementia. 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 and with IV contrast | Usually appropriate | Limited | O 0 mSv | O 0 mSv [ped] | 9 | 9 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 10 |
| | | References | | Study Quality | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|--|-------------------------|------------------|--------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|--|--|
| | | 111 (23413251) | | 4 | | | | | | | | | | | | | |
| | | 112 (37698615) | | 2 | | | | | | | | | | | | | |
| | | 113 (36304377) | | 4 | | | | | | | | | | | | | |
| MRI head without IV contrast | Usually appropriate | Limited | 0 0 mSv | 0 0 mSv [ped] | 8 | 8 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 4 | 6 | | |
| | | References | | Study Quality | | | | | | | | | | | | | |
| | | 111 (23413251) | | 4 | | | | | | | | | | | | | |
| | | 112 (37698615) | | 2 | | | | | | | | | | | | | |
| | | 113 (36304377) | | 4 | | | | | | | | | | | | | |
| CT head without IV contrast | Usually appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼ 0.3-3 mSv [ped] | 7 | 7 | 0 | 0 | 0 | 0 | 1 | 0 | 9 | 3 | 3 | | |
| 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 and with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 15 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Expert Consensus | 0 0 mSv | 0 0 mSv [ped] | 1 | 1 | 10 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | | |
| MR spectroscopy head without IV contrast | Usually not appropriate | Expert Consensus | 0 0 mSv | 0 0 mSv [ped] | 1 | 1 | 8 | 2 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | | |
| SPECT or SPECT/CT brain striatal | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 13 | 3 | 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 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | |
| FDG-PET/CT brain | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 1 | 1 | 10 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | | |
| Amyloid PET/CT brain | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 14 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

| | | | | | | | | | | | | | | | |
|------------------|-------------------------|------------------|--------------|--|---|---|---|---|---|---|---|---|---|---|---|
| Tau PET/CT brain | Usually not appropriate | Expert Consensus | ☢☢☢ 1-10 mSv | | 1 | 1 | 9 | 1 | 1 | 2 | 0 | 0 | 1 | 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.