



|                      |                    |               |              |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |
|----------------------|--------------------|---------------|--------------|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|
|                      |                    | 28 (18287270) |              | 3 |   |   |   |   |   |   |   |   |   |   |   |  |  |  |
| Amyloid PET/CT brain | May be appropriate | Strong        | ☼☼☼ 1-10 mSv |   | 5 | 5 | 0 | 0 | 1 | 3 | 6 | 5 | 1 | 0 | 0 |  |  |  |

| References    | Study Quality |
|---------------|---------------|
| 26 (26646994) | 4             |
| 14 (14991808) | 3             |
| 15 (19587325) | 3             |
| 22 (20038776) | 4             |
| 16 (21245183) | 2             |
| 17 (22331215) | 2             |
| 20 (20501908) | 3             |
| 25 (-3144437) | 4             |
| 24 (23753186) | 4             |
| 23 (23359661) | 4             |
| 19 (21764791) | 2             |
| 18 (20687209) | 1             |
| 21 (26613792) | Good          |

|                                       |                         |         |         |               |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------|-------------------------|---------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MRI head without and with IV contrast | Usually not appropriate | Limited | ○ 0 mSv | ○ 0 mSv [ped] | 3 | 3 | 5 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|---------------------------------------|-------------------------|---------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|

| References    | Study Quality |
|---------------|---------------|
| 35 (24331205) | 1             |
| 10 (22517954) | 4             |
| 9 (11342678)  | 4             |
| 34 (19460794) | 3             |
| 36 (21969707) | 3             |
| 33 (20139996) | 4             |

|                               |                         |         |              |                      |   |     |   |   |   |   |   |   |   |   |   |   |
|-------------------------------|-------------------------|---------|--------------|----------------------|---|-----|---|---|---|---|---|---|---|---|---|---|
| HMPAO SPECT or SPECT/CT brain | Usually not appropriate | Limited | ☼☼☼ 1-10 mSv | ☼☼☼☼☼ 3-10 mSv [ped] | 3 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|-------------------------------|-------------------------|---------|--------------|----------------------|---|-----|---|---|---|---|---|---|---|---|---|---|

| References    | Study Quality |
|---------------|---------------|
| 9 (11342678)  | 4             |
| 38 (18855165) | 3             |









|  |                         |            |               |                     |               |   |    |   |   |   |   |   |   |   |   |  |  |  |
|--|-------------------------|------------|---------------|---------------------|---------------|---|----|---|---|---|---|---|---|---|---|--|--|--|
|  |                         |            | 52 (28592453) |                     | 4             |   |    |   |   |   |   |   |   |   |   |  |  |  |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Limited    | ○ 0 mSv       | ○ 0 mSv [ped]       | 2             | 2 | 8  | 3 | 3 | 1 | 0 | 0 | 0 | 1 | 0 |  |  |  |
|  |                         | References |               |                     | Study Quality |   |    |   |   |   |   |   |   |   |   |  |  |  |
|  |                         |            | 56 (22189566) |                     | 3             |   |    |   |   |   |   |   |   |   |   |  |  |  |
| MRI head without and with IV contrast          | Usually not appropriate | Limited    | ○ 0 mSv       | ○ 0 mSv [ped]       | 2             | 2 | 5  | 6 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |
|  |                         | References |               |                     | Study Quality |   |    |   |   |   |   |   |   |   |   |  |  |  |
|  |                         |            | 57 (26572170) |                     | 3             |   |    |   |   |   |   |   |   |   |   |  |  |  |
|  |                         |            | 35 (24331205) |                     | 1             |   |    |   |   |   |   |   |   |   |   |  |  |  |
| MR spectroscopy head without IV contrast       | Usually not appropriate | Limited    | ○ 0 mSv       | ○ 0 mSv [ped]       | 2             | 2 | 8  | 2 | 5 | 0 | 0 | 1 | 0 | 0 | 0 |  |  |  |
|  |                         | References |               |                     | Study Quality |   |    |   |   |   |   |   |   |   |   |  |  |  |
|  |                         |            | 55 (24468473) |                     | 3             |   |    |   |   |   |   |   |   |   |   |  |  |  |
| CT head with IV contrast                       | Usually not appropriate | Limited    | ☼☼☼ 1-10 mSv  | ☼☼☼ 0.3-3 mSv [ped] | 1             | 1 | 13 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |
|  |                         | References |               |                     | Study Quality |   |    |   |   |   |   |   |   |   |   |  |  |  |
|  |                         |            | 52 (28592453) |                     | 4             |   |    |   |   |   |   |   |   |   |   |  |  |  |
| CT head without and with IV contrast           | Usually not appropriate | Limited    | ☼☼☼ 1-10 mSv  | ☼☼☼☼ 3-10 mSv [ped] | 1             | 1 | 13 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |
|  |                         | References |               |                     | Study Quality |   |    |   |   |   |   |   |   |   |   |  |  |  |
|  |                         |            | 52 (28592453) |                     | 4             |   |    |   |   |   |   |   |   |   |   |  |  |  |

**Variant 4: Suspected vascular 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 mSv    | ○ 0 mSv [ped] | 9      | 9      | 0                 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 12 |  |  |  |

| References    | Study Quality |
|---------------|---------------|
| 28 (18287270) | 3             |
| 65 (22184621) | 4             |
| 66 (18436880) | 2             |

|                                       |                         |                  |              |                     |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------|-------------------------|------------------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| CT head without IV contrast           | Usually appropriate     | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼ 0.3-3 mSv [ped] | 8 | 8 | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 5 | 4 |
| CTA head and neck with IV contrast    | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 3 | 3 | 3 | 3 | 4 | 1 | 5 | 0 | 0 | 0 | 0 |
| MRA head without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 3 | 3 | 3 | 1 | 6 | 1 | 3 | 2 | 0 | 0 | 0 |
| MRA neck without IV contrast          | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 3 | 3 | 4 | 2 | 5 | 1 | 4 | 0 | 0 | 0 | 0 |
| MRA neck without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv      | ○ 0 mSv [ped]       | 3 | 3 | 6 | 2 | 7 | 0 | 1 | 0 | 0 | 0 | 0 |
| MRI head without and with IV contrast | Usually not appropriate | Limited          | ○ 0 mSv      | ○ 0 mSv [ped]       | 3 | 3 | 5 | 3 | 3 | 4 | 1 | 0 | 0 | 0 | 0 |

| References    | Study Quality |
|---------------|---------------|
| 28 (18287270) | 3             |
| 65 (22184621) | 4             |
| 66 (18436880) | 2             |

|                  |                         |         |              |                     |   |   |   |   |   |   |   |   |   |   |   |
|------------------|-------------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|
| FDG-PET/CT brain | Usually not appropriate | Limited | ☼☼☼ 1-10 mSv | ☼☼☼☼ 3-10 mSv [ped] | 3 | 3 | 3 | 0 | 7 | 5 | 1 | 0 | 0 | 0 | 0 |
|------------------|-------------------------|---------|--------------|---------------------|---|---|---|---|---|---|---|---|---|---|---|

| References    | Study Quality |
|---------------|---------------|
| 61 (23043907) | 4             |

|                           |                         |         |         |               |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|-------------------------|---------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|
| US duplex Doppler carotid | Usually not appropriate | Limited | ○ 0 mSv | ○ 0 mSv [ped] | 3 | 3 | 3 | 4 | 3 | 1 | 5 | 0 | 0 | 0 | 0 |
|---------------------------|-------------------------|---------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|

| References    | Study Quality |
|---------------|---------------|
| 67 (22537454) | 3             |



|  |                         |                  |              |                      |   |     |    |   |   |   |   |   |   |   |   |  |
|--|-------------------------|------------------|--------------|----------------------|---|-----|----|---|---|---|---|---|---|---|---|--|
| HMPAO SPECT or SPECT/CT brain                  | Usually not appropriate | Limited          | ☹☹☹ 1-10 mSv | ☹☹☹☹ 3-10 mSv [ped]  | 3 | n/a | 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
|  |                         | References       |              | Study Quality        |   |     |    |   |   |   |   |   |   |   |   |  |
|  |                         | 50 (9527139)     |              | 2                    |   |     |    |   |   |   |   |   |   |   |   |  |
| HMPAO SPECT or SPECT/CT brain                  | Usually not appropriate | Limited          | ☹☹☹ 1-10 mSv | ☹☹☹☹ 3-10 mSv [ped]  | 3 | 3   | 4  | 0 | 7 | 4 | 1 | 0 | 0 | 0 | 0 |  |
|  |                         | References       |              | Study Quality        |   |     |    |   |   |   |   |   |   |   |   |  |
|  |                         | 50 (9527139)     |              | 2                    |   |     |    |   |   |   |   |   |   |   |   |  |
| MRA head without and with IV contrast          | Usually not appropriate | Expert Consensus | ○ ○ mSv      | ○ ○ mSv [ped]        | 2 | 2   | 6  | 3 | 4 | 0 | 1 | 1 | 0 | 1 | 0 |  |
| CT head with IV contrast                       | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | ☹☹☹☹ 0.3-3 mSv [ped] | 1 | 1   | 10 | 5 | 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   | 13 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| MRI functional (fMRI) head without IV contrast | Usually not appropriate | Expert Consensus | ○ ○ mSv      | ○ ○ mSv [ped]        | 1 | 1   | 9  | 4 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |  |
| MR spectroscopy head without IV contrast       | Usually not appropriate | Limited          | ○ ○ mSv      | ○ ○ mSv [ped]        | 1 | 1   | 9  | 4 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |  |
|  |                         | References       |              | Study Quality        |   |     |    |   |   |   |   |   |   |   |   |  |
|  |                         | 62 (9341699)     |              | 2                    |   |     |    |   |   |   |   |   |   |   |   |  |
|  |                         | 63 (1513253)     |              | 3                    |   |     |    |   |   |   |   |   |   |   |   |  |

**Variant 5: Suspected idiopathic 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 | 1 | 2 | 12 |

|  |                         | References       | Study Quality |                     |   |     |    |   |   |   |   |   |   |   |   |
|--|-------------------------|------------------|---------------|---------------------|---|-----|----|---|---|---|---|---|---|---|---|
|  |                         | 70 (29213984)    | 4             |                     |   |     |    |   |   |   |   |   |   |   |   |
| CT head without IV contrast              | Usually appropriate     | Expert Consensus | ☼☼☼ 1-10 mSv  | ☼☼☼ 0.3-3 mSv [ped] | 8 | 8   | 1  | 0 | 0 | 0 | 0 | 2 | 1 | 5 | 7 |
| DTPA cisternography                      | May be appropriate      | Limited          | ☼☼☼ 1-10 mSv  |                     | 4 | n/a | 0  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |                         | References       | Study Quality |                     |   |     |    |   |   |   |   |   |   |   |   |
|  |                         | 68 (26644048)    | 4             |                     |   |     |    |   |   |   |   |   |   |   |   |
| DTPA cisternography                      | May be appropriate      | Limited          | ☼☼☼ 1-10 mSv  |                     | 4 | 4   | 1  | 0 | 3 | 9 | 3 | 0 | 0 | 0 | 0 |
|  |                         | References       | Study Quality |                     |   |     |    |   |   |   |   |   |   |   |   |
|  |                         | 68 (26644048)    | 4             |                     |   |     |    |   |   |   |   |   |   |   |   |
| HMPAO SPECT or SPECT/CT brain            | May be appropriate      | Limited          | ☼☼☼ 1-10 mSv  | ☼☼☼☼ 3-10 mSv [ped] | 4 | 4   | 2  | 0 | 6 | 6 | 2 | 0 | 0 | 0 | 0 |
|  |                         | References       | Study Quality |                     |   |     |    |   |   |   |   |   |   |   |   |
|  |                         | 71 (19284245)    | 2             |                     |   |     |    |   |   |   |   |   |   |   |   |
| MRI head without and with IV contrast    | Usually not appropriate | Limited          | ○ 0 mSv       | ○ 0 mSv [ped]       | 2 | 2   | 6  | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |                         | References       | Study Quality |                     |   |     |    |   |   |   |   |   |   |   |   |
|  |                         | 70 (29213984)    | 4             |                     |   |     |    |   |   |   |   |   |   |   |   |
| CT head with IV contrast                 | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv  | ☼☼☼ 0.3-3 mSv [ped] | 1 | 1   | 9  | 6 | 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   | 12 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| MR spectroscopy head without IV contrast | Usually not appropriate | Limited          | ○ 0 mSv       | ○ 0 mSv [ped]       | 1 | 1   | 12 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
|  |                         | References       | Study Quality |                     |   |     |    |   |   |   |   |   |   |   |   |
|  |                         | 69 (20647518)    | 2             |                     |   |     |    |   |   |   |   |   |   |   |   |

## **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](http://www.acr.org/ac).