Table 2. Study Characteristics and Outcomes for Dementia Screening (Dementia vs. MCI/Normal), Brief Instruments

| **Study,**  **Quality** | **Instrument (non-English Language)** | **Est. Time (Min)** | **N Screened,**  **N Analyzed** | **Selection Criteria** | **Age (y),**  **% Female,**  **Education (y)** | **% Dementia** | **Diagnostic Verification** | **Cut Point** | **Sens. (95% CI or SE)** | **Spec. (95% CI or SE)** | **PPV (95% CI)** | **NPV (95% CI)** | **AUC (95% CI or SE)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Brodaty, 200269  Fair | Abbreviated Mental Test (AMT) | 5-7 | 283  269 | 50-74 y (with memory problem) or ≥75 y  PC | 79.6  59.4  55.8% >8 y | 29 | All | 7/8 | 42 (31, 53\*\*) | 93 (89, 96\*\*) | 71 (55.9, 83.1\*\*) | 80 (73.9, 84.5\*\*) | 78 (71-84) |
| Hooijer, 199265  Fair | AMT (Dutch) | 5-7 | 358  358 | Older adults  PC | NR  NR  NR | 3.6 | All | 7/8 | 92.3 (64.0, 99.8\*\*) | 95.4 (92.6, 97.3\*\*) | 42.9 (24.5, 62.8\*\*) | 99.7\*\* (98.3, 100.0\*\*) | NR |
| Rait, 200072  Fair | AMT | 5-7 | 130  96 | ≥60 y  Jamaican  PC | 69  50  9 | 6 | All | ≥8 | 100 (54, 100) | 83 (76, 91) | 28.6\*\* (11.3, 52.2\*\*) | 100.0\*\* (95.2, 100.0\*\*) | NR |
| Rait, 200073  Fair | AMT (Bangladeshi, Gujarati, Hindi, Punjabi, Urdu) | 5-7 | 120  101 | ≥60 y  Gujarati or Pakistani  PC | 69.2  52.5  NR | 11 | All | 6 [Gujarati]  7  [Pak] | 100 (16.0, 100) [Gujarati]  100 (66.4, 100)  [Pak] | 95.0 (85.8, 99.0) [Gujarati]  86.7 (68.4, 95.6)  [Pak] | NR†† | NR†† | NR |
| Grober, 200853  Good | Free and Cued Selective Reminding Test (FCSRT) | <7‡ | 318  318 | ≥65 y  non-Hispanic White or Black  PC | 78.7  83  12.6 | 17.6 | All | 25 | 86 (41, 100) | 73 (56, 96) | 40.3\*\* (31.5, 49.7\*\*) | 96.0\*\* (92.2, 98.3\*\*) | NR |
| Del Ser, 200651  Fair | Total Free and Cued Recall (FCR) (Spanish) | <7‡ | 527  416 | ≥65 y  Community | 79  51.7  63% <Primary School | 11.5 | All | NR | 100 (92.6, 100\*\*) | 87.2 (83.4, 90.5\*\*) | 50.5 (40.1, 61.0\*\*) | 100 (98.9, 100\*\*) | 99.4 (NR) |
| Del Ser, 200651  Fair | 7 Minute Screen (Spanish) | 7 | 527  416 | ≥65 y  Community | 79  51.7  63% <primary School | 11.5 | All | NR | 100 (92.6, 100\*\*) | 95.1 (92.4, 97.1\*\*) | 78.6 (60.4, 83\*\*) | 100 (99, 100\*\*) | 99.6 (NR) |
| Solomon, 200074  Fair | 7 Minute Screen | 7 | 137  137 | ≥60 y  PC | 77.0  67.2  11.8 | 8.0 | Subset | 0.3/0.7 [no patients scored between 0.3 & 0.7] | 100\* (71.5, 100\*) | 100\* (86.8, 100\*) | 100\* (71.5, 100\*) | 100\* (86.8, 100\*) | NR |
| Manly, 201175  Fair | Telephone for Cognitive Status (TICS) (English or Spanish) | 7-9 | 377  377 | ≥65 y  PC | 81.4  68.2  10.4 | 14.1 | All | ≤22 | 88 (77, 96\*\*) | 87 (83, 91\*\*) | 51 (41.9, 63.5\*\*) | 98 (95.5, 99.2\*\*) | 94 (NR) |
| Lipton, 200362  Fair | TICS | 7-9 | 300  300 | ≥65 y  PC | 79.3  66.0  12.8 | 9 | Subset | 28 | 74 (54, 89\*\*) | 86 (81, 90\*\*) | 34 (22.5, 48.1\*\*) | 97.1\*\* (94.1, 98.8\*\*) | 86 (NR) |
| Brodaty, 200269  Fair | Mini-Mental State Examination (MMSE) | 7-10 | 283  283 | 50-74 y (with memory problem) or ≥75 y  PC | 79.6  59.4  55.8% >8 y | 29 | All | 24/25 [23/24 reported in text] | 81 (70, 88\*\*) | 76 (70, 82\*\*) | 57 (48.3, 67.1\*\*) | 90 (85.1, 94.5\*\*) | 85 (80-90) |
| Callahan, 200267  Fair | MMSE | 7-10 | 2212  269 | ≥65 y  Black  Community | 74.4  59.4  10.4 | 4.3 | Subset | ≤24 | 98.4 (78.2, 100\*\*) | 83.6 (79.1, 87.4\*\*) | 21.1 (12.7, 33.3\*\*) | 99.9 (98.7, 100\*\*) | 96 (NR) |
| Cruz-Orduna, 201171  Fair | MMSE (Spanish) | 7-10 | 160  160 | Cognition-related complaint  PC | 72.4  70  88.8% ≤primary school | 9.4 | All | 18/19 | 80.0 (51.9, 95.7\*\*) | 86.2 (79.5, 91.4\*\*) | 37.5 (21.1, 56.3\*\*) | 97.7 (93.3, 99.5\*\*) | 89 (82, 95) |
| Cullen, 200576  Fair | MMSE | 7-10 | 1142  1115 | ≥65 y  PC | 74.8  68  9.9 | 3.9 | All | <24 | 90.9 (78.3, 97.5\*\*) | 87.1 (85.0, 89.1\*\*) | 22.5\*\* (16.6, 29.3\*\*) | 99.6\*\* (98.9, 99.9\*\*) | NR |
| Fillenbaum, 199064  Fair | MMSE | 7-10 | 164  164 | ≥65 y  Community | NR  57.9  NR | 16.4 | All | NR | 100\* (86.8, 100\*) | 77.4\* (69.4, 84.2\*) | 46.4\* (33, 60.3\*) | 100\* (96.5, 100\*) | NR |
| Fong, 201168  Fair | MMSE | 7-10 | 709  709 | ≥70 y  Community | 78.8  60  NR | 1.2 | All | <24 | 87 (78, 95) | 89 (86, 92) | 52 (44, 60) | 98  (96, 99) | 95 (NR) |
| Gagnon, 199077  Fair | MMSE (French) | 7-10 | 2730  2730 | ≥65 y  Community | 74.6  59.4  66% ≤primary school | 3.7 | All | 24 | 100 (96, 100\*) | 78 (77, 80\*) | 15.0 (12.4, 17.9\*) | 100\* (99.8, 100\*) | NR |
| Grut, 199378  Fair | MMSE (Swedish) | 7-10 | 1810  668 | >74 y  Community | NR  76.1  46.1 ≥HS | 14.1 | Subset | 24/25 | 90 (NR††) | 86 (NR††) | 57 (NR††) | NR†† | NR |
| Heun, 199866  Fair | MMSE (German) | 7-10 | 291  287 | 60-100 y  Community | 76.6  59.9  9.5 | 12.9 | All | ≤24 | 92 (78, 98\*\*) | 96 (93, 98\*\*) | 77.3\*\* (62.2, 88.5\*\*) | 98.8\*\* (96.4, 99.7\*\*) | 98.8 (88.0, 100) |
| Hooijer, 199265  Fair | MMSE (Dutch) | 7-10 | 358  358 | Older adults  PC | NR  NR  NR | 3.6 | All | 23/24 | 76.9 (46.2, 95.0\*\*) | 96.5 (94.0, 98.2\*\*) | 45.5 (24.4, 67.8\*\*) | 99.1\*\* (97.4, 99.8\*\*) | NR |
| Jeong, 200479  Good | MMSE (Korean) | 7-10 | 235  235? | ≥65 y  Community | 73.5  66.4  1 (median) | 19.6 | All | 18/19 | 91 (79, 98) | 76 (69, 82) | 48.3\*\* (37.4, 59.3\*\*) | 97.3\*\* (93.2, 99.3\*\*) | 89 (2) |
| Jorm, 199680  Fair | MMSE | 7-10 | 144  143 | POW/  veteran | 72.9  0  NR | NR | All | 26/27 | 67 (NR††) | 85 (NR††) | NR†† | NR†† | 81 (5) |
| Kahle-Wrobleski, 200781  Fair | MMSE | 7-10 | 435  435 | ≥90 y  Retirement community | 95  74  73% >12 y | 36 | All | 24 | 85.2\*\* (78.6, 90.4\*\*) | 80.7\*\* (75.6, 85.2\*\*) | 71.0\*\* (63.9, 77.4\*\*) | 90.8\*\* (86.5, 94.1\*\*) | 92 |
| Kaufer, 200859  Fair | MMSE | 7-10 | 146  146 | ≥65 y  Residential care/  assisted living | 83.4  79  Majority with ≥HS | 38 | All | <27 | 82 (69, 91) | 67 (56, 77) | 60 (48, 71.2\*\*) | 86 (75.6, 93\*\*) | 85.4 (NR) |
| Kay, 198582  Fair | MMSE | 7-10 | 274  274 | ≥70 y  Community | NR (158 were 70-79, 116 were 80+  63.5 | 14.2 | All | 24/25 | 84.6 (69.5, 94.1\*\*) | 80.8 (75.2, 85.7\*\*) | 42.3\*\* (31.2, 54\*\*) | 96.9\*\* (93.5, 98.9\*\*) | NR |
| Kirby, 200154  Fair | MMSE | 7-10 | 648  648 | ≥65 y  PC | 75.0  NR  10.8 | 6.3 | All | <24 | 88 (74, 96\*) | 88 (85, 90\*) | 32.4\* (23.9, 42.0\*) | 99.1\* (97.8, 99.7\*) | NR |
| Lam, 200883  Fair | MMSE (Chinese - Cantonese) | 7-10 | 459  459 | Community | 71.2  54.5  4.8 | 9.6 | All | NR | NR | NR | NR | NR | 81.1 (NR) |
| Lavery, 200755  Fair | MMSE | 7-10 | 1107  339 | ≥65 y  PC | 77.5  68.7  66.8% ≥12 y | 9.7 | Subset | ≥22 | 68 (48, 84\*\*) | 92 (88, 95\*\*) | 45 (29.9, 61.3\*\*) | 97 (93.8, 98.5\*\*) | 91.2 (NR) |
| McDowell, 199784  Fair | MMSE (English or French) | 7-10 | 1600  1600 | ≥65 y | 80.0  59  8.6 | 23 | Subset | 24 | 63 (58, 68\*\*) | 89 (87, 91\*\*) | 63.0\*\* (57.9, 68\*\*) | 89.0\*\* (87.1, 90.7\*\*) | 89 (1.2) |
| Morales, 199785  Fair | MMSE (Spanish) | 7-10 | 257(97 urban, 160 rural)  257 | ≥65 y (urban); ≥60 y (rural)  Community | 74.1  61.9  4.9 | 13.2 | Subset | 21  [urban]  20  [rural] | 73 (39, 94\*\*)  [urban]  83 (61, 95\*\*)  [rural] | 78 (68, 86\*\*)  [urban]  74 (66, 81\*\*)  [rural] | 30(13.8, 50.2\*\*) [urban]  34 (22.2, 48.6\*\*) [rural] | 96 (88.0, 99.1\*\*) [urban]  95 (90.5, 99.0\*\*) [rural] | NR |
| Rait, 200072  Fair | MMSE | 7-10 | 130  96 | ≥60 y  Jamaican  PC | 69  50  9 | 6 | All | ≥27 | 100 (54, 100) | 69 (60, 78) | 17.7\*\* (6.8, 34.5\*\*) | 100\*\* (94.2, 100\*\*) | NR |
| Rait, 200073  Fair | MMSE (Bangladeshi, Gujarati, Hindi, Punjabi, Urdu) | 7-10 | 120  101 | ≥60 y  Gujarati or Pakistani  PC | 69.2  52.5  NR | 11 | All | 24 [Gujarati]  27  [Pak] | 100 (16.0, 100) [Gujarati]  100 (66.4, 100) [Pak] | 95.0 (85.8, 99.0) [Gujarati]  76.7 (57.3, 89.4) [Pak] | NR†† | NR†† | NR |
| Reischies, 199786  Fair | MMSE (German) | 7-10 | 516  449 | ≥70 y  Community | NR  NR  NR | 19.4 | All | 24/25 | 84.1 (74.5, 90.9\*\*) | 83.1 (78.9, 86.9\*\*) | 54.5\*\* (45.7, 63.1\*\*) | 95.6\*\* (92.7, 97.6\*\*) | NR |
| Scharre, 201087  Fair | MMSE | 7-10 | 254  63 | >59 y  Geriatric outpatient; community; independent and assisted living facilities; senior centers; memory clinic | 78  66.7  93.7% ≥HS | 33 | Subset | 26 or less | 90 (70, 99\*\*) | 88 (74, 96\*\*) | 79.2\*\* (57.9, 92.9\*\*) | 94.9\*\* (82.7, 99.4\*\*) | 94.9 (NR) |
| Waite, 199888  Fair | MMSE | 7-10 | 630  360 | ≥75 y  Community; veterans | 83.9  54.8  10 | 27.5 | All | 23/24 | 84 (75, 90\*\*) | 88 (84, 92\*\*) | 72.8\*\* (63.7, 80.7\*\*) | 93.5\*\* (89.7, 96.2\*\*) | 93 (NR) |
| Reischies, 199786  Fair | MMblind (German) | 7-10 | 516  491 | ≥70 y  Community | NR  NR  NR | 20.4 | All | 17/18 | 84.9 (76.5, 91.4\*\*) | 82.1 (77.9, 85.8\*\*) | 54.8\*\* (46.7, 62.8\*\*) | 95.5\*\* (92.7, 97.5\*\*) | NR |
| Markwick, 201289  Good | MoCA | 10 | 107  107 | MMSE ≥24  NR | 76  54  76.6% >12 y | 7.5 | All | <26 | 100.0\* (63.1, 100.0\*) | 66.7\* (56.3, 76.0\*) | 20.0\* (9.1, 35.7\*) | 100.0\* (94.4, 100.0\*) | NR |
| Waite, 199888  Fair | Short Concord Informant Dementia Scale | 6-11 | 630  360 | ≥75 y  Community; veterans | 83.9  54.8  10 | 27.5 | All | 3/4 | 83 (74, 90\*\*) | 87 (82, 91\*\*) | 70.7\*\* (61.5, 78.8\*\*) | 93.0\*\* (89.1, 95.9\*\*) | 89 (NR) |
| Del Ser, 200651  Fair | Benton’s Orientation Test (Spanish) | <7‡ | 527  416 | ≥65 y  Community | 79  51.7  63% <Primary School | 11.5 | All | NR | 95.8 (85.8, 99.5\*\*) | 85.5 (81.6, 89.0\*\*) | 46.4 (36.4, 56.8\*\*) | 99.3 (97.7, 99.9\*\*) | 97.0 (NR) |
| Fillenbaum, 199064  Fair | Kendrick Cognitive tests | <7‡ | 164  164 | ≥65 y  Community | NR  57.9  NR | 16.4 | All | NR | 65.4\* (44.3, 82.8\*) | 94.7\* (89.5, 97.9\*) | 70.8\* (48.9, 87.4\*) | 93.3\* (87.7, 96.9\*) | NR |
| Heun, 199866  Fair | Word List Learning (German) | <7‡ | 291  287 | 60-100 y  Community | 76.6  59.9  9.5 | 12.9 | All | ≤3 [IR]  ≤6 [IRH]  ≤1 [IRFA] | 82 (65, 92\*\*) [IR]  57 (39, 73\*\*) [IRH]  23 (12, 41\*\*)  [RFA] | 77 (71, 82\*\*) [IR]  71 (65, 76\*\*)  [IRH]  77 (71, 82\*\*)  [RFA] | 34.1\*\* (24.3, 45\*\*) [IR]  22.3\*\* (14.4, 32.1\*\*) [IRH]  13.4\*\* (6.3, 24.0\*\*) [RFA] | 96.5\*\* (92.9, 98.6\*\*) [IR]  91.8\*\* (87, 95.2\*\*) [IRH]  87.3\*\* (82.2, 91.4\*\*) [RFA] | 87.1 (81.4, 92.8) [IR]  67.0 (56.2, 77.8) [IRH]  51.5 (40.1, 62.9) [IRFA] |
| Heun, 199866  Fair | Labyrinth Test (German) | <7‡ | 291  287 | 60-100 y  Community | 76.6  59.9  9.5 | 12.9 | All | ≤80 [sec]  ≤3 [mis] | 56 (39, 73\*\*)  [sec]  88 (75, 97\*\*)  [mis] | 84 (79, 88\*\*)  [sec]  60 (54, 66\*\*)  [mis] | 34.4\*\* (22.7. 47.7\*\*) [sec]  24.8\*\* (17.7, 33.0\*\*) [mis] | 92.9\*\* (88.8, 95.9\*\*) [sec]  97.4\*\* (93.5, 99.3\*\*) [mis] | 72.5 (59.2, 85.8) [sec]  80.2 (71.6, 88.8) [mis] |
| Lavery, 200755  Fair | Rey figure immediate recall | <7‡ | 1107  339 | ≥65 y  PC | 77.5  68.7  66.8% ≥12 y | 9.7 | Subset | NR | NR | NR | NR | NR | 88.7 (NR) |
| Lavery, 200755  Fair | Rey figure copy | <7‡ | 1107  339 | ≥65 y  PC | 77.5  68.7%  ≥12 y of education: 66.8 | 9.7 | Subset | NR | NR | NR | NR | NR | 79.8 (NR) |
| Fuchs, 201152  Fair | Immediate recall (German) | <10‡ | 423  423 | 75-89 y  PC | 82.4  68.4  62.2% “Low” level | 5.0 | All | NR | 100.0 (100.0, 100.0) | 82.8 (79.0, 86.5) | 20.7 (12.2, 29.2) | 100.0 (100.0, 100.0) | 95.7 (92.7, 98.7) |
| Kaufer, 200859  Fair | Minimum Data Set Cognition Scale (MDS-Cog) | <10‡ | 146  146 | ≥65 y  Residential care/  assisted living | 83.4  79  Majority with ≥HS | 38 | All | NR | 67 (55, 80) | 84 (76, 91) | 71.2\*\* (56.9, 82.9\*\*) | 80.9\*\* (71.4, 88.2\*\*) | 78.8 (NR) |
| Fillenbaum, 199064  Fair | Storandt Battery | 10 | 164  164 | ≥65 y  Community | NR  57.9  NR | 16.4 | All | NR | 100\* (86.8, 100\*) | 56.4\* (47.5, 65.0\*) | 31.0\* (21.3, 42.0\*) | 100\* (95.2, 100\*) | NR |

\* Calculated from 2x2 table.

\*\* Calculated using the sensitivity, specificity, and prevalence of dementia.

§ Authors called their test the Clock Completion Test.

† The SASSI includes the MMSE, Verbal Fluency, and Temporal Orientation.

‡ Assumed.

†† Confidence intervals or PPV/NPV could not be calculated.

**Abbreviations:** AMT = Abbreviated Mental Test; AUC = area under the curve; CI = confidence interval; FCR = total free and cued recall; FCSRT = Free and Cued Selective Reminding Test; IR = Immediate Recall; IRFA = Immediate Recognition False Alarm; IRH = Immediate Recognition Hit; MDS-Cog = Minimum Data Set Cognition Scale; mis = mistake; MMSE = Mini-Mental State Examination; N = number; NPV = negative predictive value; NR = not reported; PC = primary care; POW = prisoner of war; PPV = positive predictive value; RFA = Recognition False Alarm; SE = standard error; TICS = Telephone for Cognitive Status; y = year