Supplementary Material*


Supplement. Cognitive Training Supplement

Part A. Methods: Search Strategies and Outcome Tables

Supplement Table A1. Cognitive Outcomes Categorization

Supplement Table A2. Neuropsychological Tests and Reliable Change Indices

Part B. Supplement Figure. Literature Flow Diagram

Part C. Data Tables


Supplement Table C2. Summary Risk-of-Bias Assessments: Other Cognitive Training Trials in Adults With Normal Cognition

Supplement Table C3. Cognitive Training Interventions to Prevent Dementia in Adults With MCI: Eligible Trials, Intervention Descriptions, Inclusion Criteria, and Population Characteristics

Supplement Table C4. Summary Risk-of-Bias Assessments: Other Cognitive Training Trials in Adults With MCI

References

* This supplementary material was provided by the authors to give readers further details on their article. The material was reviewed but not copyedited.
Part A.

Search Strategies

Database: Ovid MEDLINE(R)
Search Strategy: RCTs

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1 exp Tertiary Prevention/ or exp Secondary Prevention/ or exp Primary Prevention/ (141964)
2 prevent*.ti. (216549)
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21 salt*.ti. (34028)
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33 exp Antihypertensive Agents/ (234730)
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42 antiamyloid*.ti. (26)
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44 crenezumab.ti. (0)
45 gantenerumab.ti. (6)
46 crenezumab.ab. (4)
47 antiplatlet.ti. (0)
48 anti-platelet.ti. (782)
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memory disorders/ (16505)
executive function/ (0)
exp memory/ (107625)
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Search Strategy: Observational Studies

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Database: Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations
Search Strategy: RCTs

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memory disorders/ (0)
executive function/ (0)
exp memory/ (0)
cognition.ti. (1391)
((cognit* or neurocognit* or memory or neuropsy* or neuro*) adj (impair* or disorder* or dysfunction* or function* ag?ing or declin* or status or perform* or diabili* or disable* or maint* or enhanc*)).ti. (4103)
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(amyloid or tau or plasticity).ti. (4251)
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83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 96 (12603)
82 and 97 (1485)
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*Mild Cognitive Impairment/pc [Prevention & Control] (0)
Cognition Disorders/pc [Preventions & Control] (0)
or/98-101 (1485)
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single blind method/ (0)
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randomized controlled trial.pt. (759)
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7 intervention*.ti. (128336)
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25 vegetable*.ti. (11437)
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45 Acetylcholineesterase inhibitor*.ti. (1226)
46 (Donepezil or Aricept or Memantine or Namenda or Rivastigmine or Exelon or Galantamine or razadyne or Quetiapine or seroquel).ti. (7323)
47 cholinesterase inhibitor*.ti. (1672)
48 exp Antibodies, Monoclonal/ or exp Antibodies, Monoclonal, Humanized/ (394269)
49 anti amyloid*.ti. (214)
50 antiamyloid*.ti. (40)
51 Solanezumab.ti. (43)
52 crenezumab.ti. (2)
53 gantenerumab.ti. (9)
54 crenezumab.ab. (14)
55 antiplatlet.ti. (8)
56 anti-platelet.ti. (1311)
(Triflusal or Ticlid or plavix or brilinta or persantine or Ticlopidine or Dipyridomole or Clopidogrel).ti. (8156)
exp Hypoglycemic Agents/ (408843)
(Pioglitazone or actos or Glucophage or metformin).ti. (12917)
((gonadal or sex) adj steroid*).ti. (4750)
exp Hormone Replacement Therapy/ (52856)
estrogen*.ti. (59100)
progest*.ti. (35701)
medroxyprogesterone*.ti. (2555)
estriadiol.ti. (22509)
raloxifene.ti. (1622)
exp Cyclooxygenase 2 Inhibitors/ (42579)
(Celecoxib or Rofecoxib).ti. (3619)
exp Anti-Inflammatory Agents, Non-Steroidal/ (490780)
(Ibuprofen or Tarenflurbil or flurbiprofen or Flurizan or Naproxen or Aspirin).ti. (30083)
exp Dietary Supplements/ (72740)
supplement*.ti. (59036)
nutraceutical*.ti. (1163)
exp Nootropic Agents/ (98194)
nootropic*.ti. (693)
exp Vitamins/ (573824)
exp Minerals/ (36345)
omega.ti. (10406)
ginkago biloba.ti. (2538)
ginko biloba.ti. (20)
folate.ti. (10490)
fish oil.ti. (3894)
saffron.ti. (625)
crocus sativus.ti. (434)
fuzhisan.ti. (12)
melissat.ti. (356)
beta carotene.ti. (3702)
vitamin*.ti. (113036)
((manag* or control* or lower* or reduc* or decreas* or loss or lose) and (weight or BMI or body mass index or overweight or obes* or diabetes or depress* or cardio* or vascular or blood pressure or hypertension or cholesterol or hypercholesterolemia or homocysteine)).ti. (127982)
on/1-89 (6007082)
dementia/ or *alzheimer disease/ (122973)
dementia or cognitive impair*.ti. (60302)
*Cognition/ (57927)
*Mild Cognitive Impairment/ (5955)
*memory disorders/ (2392)
*executive function/ (0)
exp *memory/ (86144)
cognition.ti. (12039)
((cognit* or neurocognit* or memory or neuropsy* or neuro*) adj (impair* or disorder* or dysfunction* or function* ag?ing or declin* or status or perform* or diabil* or disable* or maint* or enhanc*)).ti. (50252)
exp Biological Markers/ (172233)
(91 or 94) and 103 (4462)
91 or 92 or 94 or 95 or 96 or 97 or 101 or 104 (274389)
*Alzheimer Disease/pc [Prevention & Control] (2840)
*Mild Cognitive Impairment/pc [Prevention & Control] (42)
106 or 107 (2870)
90 and 105 (57490)
108 or 109 (58108)
limit 110 to human (41595)
limit 111 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>). (1366)
limit 112 to (adult <18 to 64 years> or aged <65+ years>). (596)
(111 not 112) or 113 (40825)
Clinical trial/ (861651)
Randomized controlled trial/ (394622)
Randomization/ (69534)
Single blind procedure/ (21500)
Double blind procedure/ (130682)
Crossover procedure/ (46320)
Placebo/ (286985)
Randomized controlled trial$.tw. (129567)
Rct.tw. (19484)
Random allocation.tw. (1561)
Randomly allocated.tw. (24259)
Allocated randomly.tw. (2119)
(allocated adj2 random).tw. (905)
(waitlist or wait list).tw. (4382)
115 or 116 or 117 or 118 or 119 or 120 or 121 or 122 or 123 or 124 or 125 or 126 or 127 or 128 (1271460)
Case study/ (45524)
Case report.tw. (324413)
Abstract report/ or letter/ (967648)
130 or 131 or 132 (1330767)
129 not 133 (1236125)
114 and 134 (9013)
limit 135 to (book or book series or conference abstract or conference paper or conference proceeding or "conference review" or editorial or letter or note or short survey or trade journal) (2271)
135 not 136 (6742)
limit 137 to yr="2009 -Current" (2443)
1 prevention/ or "prevention and control"/ or primary prevention/ or prophylaxis/ or protection/ (388002)
2 prevent*.ti. (292863)
3 protect*.ti. (166106)
4 delay*.ti. (70519)
5 ((reduce* or decrease* or effect* or lower* or modif* or change* or stop* or improv* or increas* or enhanc* or raise*) and risk*).ti. (68778)
6 (biomarker* adj2 enrich*).ti. (29)
7 intervention*.ti. (128336)
8 program*.ti. (190084)
9 multidomain*.ti. (482)
10 multi-domain*.ti. (196)
11 multicomponent*.ti. (3473)
12 multi-component*.ti. (1062)
13 multifactorial*.ti. (25)
14 multi-factoral*.ti. (2)
15 approach*.ti. (256521)
16 lifestyle*.ti. (13016)
17 life style.ti. (1723)
18 exp physical activity/ (295154)
19 exp exercise/ (263840)
20 ((physical or aerobic* or leisure) and (activit* or fitness)).ti. (35810)
21 exercise*.ti. (118665)
22 exp Diet/ (271531)
23 diet*.ti. (181510)
24 fruit*.ti. (23508)
25 vegetable*.ti. (11437)
26 nutrition*.ti. (103074)
27 fat*.ti. (247795)
28 caffeine.ti. (12266)
29 sodium.ti. (99989)
30 salt*.ti. (48776)
31 alcohol*.ti. (151585)
32 ((smok* or tobacco) and (quit or cessation or stop*)).ti. (13072)
33 ((metacognitive or cognitive or mental or brain or memory or social or perceptual or computer) and (activit* or train* or stimulat* or intervention or engag* or rehab*)).ti. (53741)
34 exp "drug therapy"/ (652263)
35 drug*.ti. (450662)
36 medication*.ti. (48020)
37 pharmacopsychiatry.ti. (90)
38 exp Psychopharmacology/ (27649)
39 lovastatin/ or simvastatin/ or pravastatin/ (44198)
40 statin*.ti. (16827)
41 exp Antihypertensive Agents/ (628950)
42 anti-hypertensive*.ti. (972)
43 antihypertensive*.ti. (16198)
44 exp Cholinesterase Inhibitors/ (83861)
45 Acetylcholinesterase inhibitor*.ti. (1226)
46 (Donepezil or Aricept or Memantine or Namenda or Rivastigmine or Exelon or Galantamine or razadyne or Quetiapine or soroquel).ti. (7323)
47 cholinesterase inhibitor*.ti. (1672)
48 exp Antibodies, Monoclonal/ or exp Antibodies, Monoclonal, Humanized/ (394269)
49 anti amyloid*.ti. (214)
50 antiamyloid*.ti. (40)
51 Solanezumab.ti. (43)
52 crenezumab.ti. (2)
53 gantenerumab.ti. (9)
54 crenezumab.ab. (14)
55 antiplatelet.ti. (8)
56 anti-platelet.ti. (1311)
(Triflusal or Ticlid or plavix or brilinta or persantine or Ticlopidine or Dipyridomole or Clopidogrel).ti. (8156)
exp Hypoglycemic Agents/ (408843)
(Pioglitazone or actos or Glucophage or metformin).ti. (12917)
((gonadal or sex) adj steroid*).ti. (4750)
exp Hormone Replacement Therapy/ (52856)
estrogen*.ti. (59100)
progest*.ti. (35701)
medroxyprogesterone*.ti. (2555)
estadiol.ti. (22509)
raloxifene.ti. (1622)
exp Cyclooxygenase 2 Inhibitors/ (42579)
(Celecoxib or Rofecoxib).ti. (3619)
exp Anti-Inflammatory Agents, Non-Steroidal/ (490780)
(Ibuprofen or Tarenflurbil or flurbiprofen or Flurizan or Naproxen or Aspirin).ti. (30083)
exp Dietary Supplements/ (72740)
supplement*.ti. (59036)
nutraceutical*.ti. (1163)
exp Nootropic Agents/ (98194)
nootropic*.ti. (693)
exp Vitamins/ (573824)
exp Minerals/ (36345)
omega.ti. (10406)
ginkgo biloba.ti. (2538)
ginko biloba.ti. (20)
folate.ti. (10490)
fish oil.ti. (3894)
saffron.ti. (625)
crocus sativus.ti. (434)
fuzhisan.ti. (12)
melissa.ti. (356)
beta carotene.ti. (3702)
vitamin*.ti. (113036)
 LogManager or control or lower or reduc or decreas or loss or lose) and (weight or BMI or body mass index or overweight or obes or diabetes or depress or cardio or vascular or blood pressure or hypertension or cholesterol or hypercholesterolemia or homocysteine)).ti. (127982)
on/1-89 (6007082)
*dementia or *alzheimer disease/ (122973)
(dementia or cognitive impair*).ti. (60302)
*Cognition/ (57927)
*Mild Cognitive Impairment/ (5955)
*memory disorders/ (2392)
*executive function/ (0)
exp *memory/ (86144)
cognition.ti. (12039)
((cognit* or neurocognit* or memory or neuropsy* or neuro*) adj (impair* or disorder* or dysfunction* or function* agg*ing or declin* or status or perform* or diабil* or disable* or maint* or enhanc*)).ti. (50252)
(exp Biological Markers/ (172233)
91 or 92 or 94 or 99 or 100 (177159)
*Alzheimer Disease/pc [Prevention & Control] (2840)
*Mild Cognitive Impairment/pc [Prevention & Control] (42)
105 or 106 (2870)
90 and 104 (46186)
107 or 108 (46804)
limit 109 to human (37668)
limit 110 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (928)
limit 111 to (adult <18 to 64 years> or aged <65+ years>) (353)
limit 110 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (928)
limit 111 to (adult <18 to 64 years> or aged <65+ years>) (353)
limit 110 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (928)
limit 111 to (adult <18 to 64 years> or aged <65+ years>) (353)
limit 110 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (928)
limit 111 to (adult <18 to 64 years> or aged <65+ years>) (353)
limit 110 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (928)
limit 111 to (adult <18 to 64 years> or aged <65+ years>) (353)
limit 110 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (928)
limit 111 to (adult <18 to 64 years> or aged <65+ years>) (353)
Clinical study/ (132584)
longitudinal study/ (85243)
prospective study/ (322344)
cohort analysis/ (230562)
(cohort adj stud*).mp. (158158)
(observational adj stud*).mp. (119842)
(follow up adj stud*).mp. (57729)
(epidemiologic* adj stud*).mp. (88591)
(cross sectional adj stud*).mp. (205524)
or/114-122 (1136620)
113 and 123 (4143)
limit 124 to (book or book series or chapter or conference abstract or conference paper or conference proceeding or "conference review" or editorial or erratum or letter or note or "review" or short survey or trade journal) (1652)
124 not 125 (2491)
limit 126 to yr="2009 -Current" (1644)
Database: PsycINFO
Search Strategy: RCTs

1 prophylaxis/ or prevention/ (14810)
2 prevent*.ti. (21271)
3 protect*.ti. (8537)
4 delay*.ti. (5830)
5 ((reduc* or decreas* or effect* or lower* or modif* or change* or stop* or improv* or increas* or enhanc* or rais*) and risk*).ti. (7006)
6 intervention*.ti. (36138)
7 program*.ti. (35798)
8 multidomain*.ti. (22)
9 multi-domain*.ti. (34)
10 multicomponent*.ti. (176)
11 multi-component*.ti. (101)
12 lifestyle*.ti. (2645)
13 ((metacognitive or cognitive or mental or brain or memory or social or perceptual or computer) and (activit* or train* or stimulat* or intervention or engag* or rehab*)).ti. (16817)
14 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 (126101)
15 *dementia/ or *alzheimer disease/ (35185)
16 "mild cognitive impairment/ (0)
17 ((cognit* or neurocognit* or memory or neuropsy* or neuro*) adj impair* or disorder* or dysfunc* or function* ag?ing or declin* or status or perform* or diabil* or disable* or maint* or enhanc*).ti. (15609)
18 ((maint* or impair* or disorder* or declin* or enhanc*) adj cognit* or neurocognit* or memory or neuropsy* or neuro*).ti. (990)
19 (amyloid or tau or plasticity).ti. (9730)
20 ((brain or grey matter or gray matter) adj3 (function* or scan* or mri or volume or chang* or imag*)).ti. (4219)
21 biological marker/ (6893)
22 dementia/ or alzheimer disease/ (39250)
23 21 and 22 (1529)
24 15 or 16 or 17 or 18 or 19 or 20 or 23 (58609)
25 14 and 24 (4017)
26 limit 25 to human (3317)
27 limit 26 to (embryo <first trimester> or infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) [Limit not valid in PsycINFO; records were retained] (72)
28 limit 27 to (adult <18 to 64 years> or aged <65+ years>) [Limit not valid in PsycINFO; records were retained] (12)
29 (26 not 27) or 28 (3257)
30 limit 29 to (clinical trial or randomized controlled trial or controlled clinical trial or multicenter study or phase 1 clinical trial or phase 2 clinical trial or phase 3 clinical trial or phase 4 clinical trial) [Limit not valid in PsycINFO; records were retained] (3257)
31 limit 30 to (book or book series or conference abstract or conference paper or conference proceeding or "conference review" or editorial or letter or note or "review" or short survey or trade journal) [Limit not valid in PsycINFO; records were retained] (283)
32 30 not 31 (2974)
33 limit 32 to yr="2009 -Current" (2013)
Database: PsycINFO
Search Strategy: Observational Studies

1 prophylaxis/ or prevention/ (14810)
2 prevent*.ti. (21271)
3 protect*.ti. (8537)
4 delay*.ti. (5830)
5 ((reduc* or decreas* or effect* or lower* or modif* or change* or stop* or improv* or increas* or enhanc* or 
   rais*) and risk*).ti. (7006)
6 intervention*.ti. (36138)
7 program*.ti. (35798)
8 multidomain*.ti. (22)
9 multi-domain*.ti. (34)
10 multidomain*.ti. (176)
11 multi-component*.ti. (101)
12 lifestyle*.ti. (2645)
13 ((metacognitive or cognitive or mental or brain or memory or social or perceptual or computer) and (activit* or 
   train* or stimulat* or intervention or engag* or rehab*)).ti. (16817)
14 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 (126101)
15 *dementia/ or *alzheimer disease/ (35185)
16 "mild cognitive impairment/ (0)
17 ((cognit* or neurocognit* or neuropsy* or neuro*) adj (impair* or disorder* or dysfunction*).ti. (9474)
18 15 or 16 or 17 (41904)
19 14 and 18 (2846)
20 limit 19 to human (2537)
21 (cohort or longitudinal or prospective).ti.ab. (115078)
22 exp Longitudinal Studies/ (1595)
23 Prospective Studies/ (216)
24 21 or 22 or 23 (115252)
25 limit 24 to "reviews (best balance of sensitivity and specificity)" (53066)
26 24 not 25 (62186)
27 20 and 26 (85)
28 limit 27 to yr="2009 -Current" (55)
Cochrane Central Register of Controlled Trials
Precise search on dementia, cognitive impairment terms
Database: Ovid MEDLINE(R)
Search Strategy:

1. exp Memory Disorders/ or exp Neuropsychological Tests/ or exp Alzheimer Disease/ or exp Cognition/ or exp Cognition Disorders/ (298451)
2. exp Alzheimer Disease/ (73521)
3. ((cognit* or memory) adj2 (impair* or declin*)).ti,ab. (58569)
4. exp Mild Cognitive Impairment/ (3643)
5. cognition.ti,ab. (34845)
6. (cognitive adj (performan* or test*)).ti,ab. (15238)
7. 1 or 2 or 3 or 4 or 5 or 6 (329242)
8. exp Cardiovascular Diseases/dh, dt, rh, su, th [Diet Therapy, Drug Therapy, Rehabilitation, Surgery, Therapy] (766074)
9. exp Depression/dh, dt, th [Diet Therapy, Drug Therapy, Therapy] (21954)
10. exp Sleep Wake Disorders/dh, dt, th [Diet Therapy, Drug Therapy, Therapy] (19655)
11. (sleep adj (quality or duration or time)).ti. (2355)
12. exp Diabetes Mellitus, Type 2/dh, dt, th [Diet Therapy, Drug Therapy, Therapy] (32195)
13. 8 or 9 or 10 or 11 or 12 (837027)
14. 7 and 13 (8871)
15. limit 14 to (clinical study or clinical trial, all or clinical trial, phase i or clinical trial, phase ii or clinical trial, phase iii or clinical trial, phase iv or clinical trial or comparative study or controlled clinical trial or meta analysis or multicenter study or observational study or pragmatic clinical trial or randomized controlled trial or systematic reviews) (2669)
16. limit 15 to yr="2009 -Current" (1210)
## Supplement Table A1. Cognitive outcomes categorization

<table>
<thead>
<tr>
<th>Test Names</th>
<th>Common Abbreviations</th>
<th>Cognitive Outcome Categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstraction (Shipley Inst. of Living Scales subtest)</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>AD Cooperative Studies AD Assessment Scale - Cognitive Subscale</td>
<td>ADAS-Cog, ADCS-Cog</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>AD Cooperative Studies ADL in MCI Scale</td>
<td>ADCS-MCI-ADL</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>AD Cooperative Studies Activities of Daily Living Scale</td>
<td>ADCS-ADL</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>Babcock Story Recall</td>
<td></td>
<td>Memory</td>
</tr>
<tr>
<td>Benton Visual Retention Test</td>
<td>BVRT</td>
<td>Memory</td>
</tr>
<tr>
<td>Blessed Dementia Rating Scale: Blessed Information Memory Concentration</td>
<td>BIMC</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Blessed Dementia Rating Scale: Blessed Rating Scale</td>
<td>BRS, DRS, BDS, Dementia score</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Block Design (WAIS subtest)</td>
<td>BD</td>
<td>Visuospatial</td>
</tr>
<tr>
<td>Boston Naming Test - multiple versions: 15, 30, 60-items</td>
<td>BNT</td>
<td>Language</td>
</tr>
<tr>
<td>Brief Visuospatial Memory Test</td>
<td>BVMT, BVMT-R</td>
<td>Memory</td>
</tr>
<tr>
<td>Brixton Spatial Anticipation Test</td>
<td>Brixton</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Buschke Selective Reminding Test</td>
<td>SRT</td>
<td>Memory</td>
</tr>
<tr>
<td>California Verbal Learning Test - multiple versions</td>
<td>CVLT, CVLT-II</td>
<td>Memory</td>
</tr>
<tr>
<td>Cancellation Tests (several versions: bell, star, letter, ...)</td>
<td></td>
<td>Visuospatial</td>
</tr>
<tr>
<td>Cambridge Neuropsychological Test Automated Battery (part of the CAMDEX)</td>
<td>CANTAB</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>CERAD word list / list learning subtest</td>
<td>CERAD</td>
<td>Memory</td>
</tr>
<tr>
<td>Clock Drawing Tests (many versions &amp; featured in screening tools)</td>
<td>CDT, CLOX</td>
<td>Visuospatial</td>
</tr>
<tr>
<td>Cognitive Abilities Screening Instrument</td>
<td>CASI</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Consortium to Establish a Registry for Alzheimer's Disease (cognitive battery)</td>
<td>CERAD</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>Continuous Performance Test</td>
<td>CPT</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Corsi Block Tapping - forwards &amp; backwards</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>(similar to Spatial Span)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dellis–Kaplan Executive Function System</td>
<td>D-KEFS</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Digit Span - forwards &amp; backwards (WAIS/WMS subtest)</td>
<td>DS, DSp</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Digit Symbol Coding (WAIS subtest; inverse of Symbol Digit Modalities)</td>
<td>DSy</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>East Boston Story or East Boston Memory Test</td>
<td>EBMT</td>
<td>Memory</td>
</tr>
<tr>
<td>Test Description</td>
<td>Code(s)</td>
<td>Domain(s)</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>Faces - parts I &amp; II (WMS subtest)</td>
<td></td>
<td>Memory</td>
</tr>
<tr>
<td>Finger Tapping Test</td>
<td>FTT</td>
<td>Motor</td>
</tr>
<tr>
<td>Grip Strength / Hand Dynamometer</td>
<td></td>
<td>Motor</td>
</tr>
<tr>
<td>Grooved Pegboard</td>
<td></td>
<td>Motor</td>
</tr>
<tr>
<td>Hopkins Verbal Learning Test</td>
<td>HVLT, HVLT-R</td>
<td>Memory</td>
</tr>
<tr>
<td>Judgement of Line Orientation</td>
<td>JLO</td>
<td>Visuospatial</td>
</tr>
<tr>
<td>Letter Digit Substitution (Coding) Test</td>
<td>LDST</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Letter-Number Sequencing (most commonly a WAIS subtest)</td>
<td>LNS</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Letter Sets</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Logical Memory - parts I &amp; II (WMS subtest)</td>
<td>LM, LMI, LMII</td>
<td>Memory</td>
</tr>
<tr>
<td>Matrix Reasoning (WAIS subtest)</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Mattis Dementia Rating Scale</td>
<td>MDRS, DRS</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>Maze Tracing (including Porteus Maze Test)</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Mini-Mental State Examination</td>
<td>MMSE</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Modified Mini-Mental State Examination</td>
<td>3MS, 3MSE</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Montreal Cognitive Assessment</td>
<td>MoCA</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>N-Back</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>National Adult Reading Test</td>
<td>NART</td>
<td>Language</td>
</tr>
<tr>
<td>Neurobehavioral Cognitive Status Examination (original Cognistat paper test)</td>
<td>NCSE</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>New York University Paragraph Recall</td>
<td></td>
<td>Memory</td>
</tr>
<tr>
<td>Number Series</td>
<td></td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Picture Completion (many versions, most commonly a WAIS subtest)</td>
<td>PC</td>
<td>Executive/Attention/Processing Speed; Visuospatial</td>
</tr>
<tr>
<td>Purdue Pegboard</td>
<td>PPT, PPBT</td>
<td>Motor</td>
</tr>
<tr>
<td>Raven's Progressive Matrices (several versions including Colored &amp; Advanced)</td>
<td>RPM, RCPM</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Reaction Time Tests (many versions: simple, choice, auditory, visual...)</td>
<td>RT, SRT</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Repeatable Battery for the Assessment of Neuropsychological Status</td>
<td>RBANS</td>
<td>Multidomain Neuropsychological Test Performance</td>
</tr>
<tr>
<td>Rey Auditory Verbal Learning Test</td>
<td>RAVLT (may see AVLT or RVLT)</td>
<td>Memory</td>
</tr>
<tr>
<td>Rey-Osterrieth Complex Figure Test</td>
<td>CFT, RCFT, Rey-O, Rey</td>
<td>Memory; Visuospatial</td>
</tr>
<tr>
<td>Rivermead Behavioral Memory Test - multiple versions</td>
<td>RBMT, RBMT-II, RBMT-3</td>
<td>Memory</td>
</tr>
<tr>
<td>Self-Ordered Pointing Task( Test)</td>
<td>SOPT</td>
<td>Executive/Attention/Processing Speed</td>
</tr>
<tr>
<td>Short Portable Mental Status Questionnaire</td>
<td>SPMSQ</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Short Test of Mental Status</td>
<td>STMS</td>
<td>Brief Cognitive Test Performance</td>
</tr>
<tr>
<td>Syndrom Kurztest - SKT (German)</td>
<td>SKT</td>
<td>Executive/Attention/Processing Speed; Memory</td>
</tr>
<tr>
<td>Test</td>
<td>Measure/Domain</td>
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</tr>
<tr>
<td>------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Spatial Span - forwards &amp; backwards (WMS subtest; similar to Corsi Block Tapping)</td>
<td>Executive/Attention/Processing Speed</td>
<td></td>
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<tr>
<td>Stroop - color, word, interference (there are many versions of the Stroop)</td>
<td>Executive/Attention/Processing Speed</td>
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<tr>
<td>Symbol Digit Modalities Test (inverse of Digit Symbol)</td>
<td>SDMT</td>
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<tr>
<td></td>
<td>Executive/Attention/Processing Speed</td>
<td></td>
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<tr>
<td>Taylor Complex Figure</td>
<td>Memory; Visuospatial</td>
<td></td>
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<tr>
<td>Telephone Interview for Cognitive Status</td>
<td>TICS</td>
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<tr>
<td></td>
<td>Brief cognitive test performance</td>
<td></td>
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<tr>
<td>Telephone Interview for Cognitive Status, modified</td>
<td>TICS-M, mTICS</td>
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<td></td>
<td>Brief cognitive test performance</td>
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<td>Token Test</td>
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<tr>
<td>Trail Making Test - part A</td>
<td>TMT A</td>
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<td></td>
<td>Executive/Attention/Processing Speed</td>
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<tr>
<td>Trail Making Test - part B (or B-A, B/A, etc.)</td>
<td>TMT B</td>
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<td>Executive/Attention/Processing Speed</td>
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<tr>
<td>Verbal Fluency, Phonemic/Phonological or Letter</td>
<td>VF, PVF, FAS, CFL, COWAT, COWA</td>
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<td></td>
<td>Executive/Attention/Processing Speed; Language</td>
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<tr>
<td>Verbal Fluency, Semantic or Category</td>
<td>VF, SVF, animals, names, fruits/vegetables</td>
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<tr>
<td></td>
<td>Language</td>
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<tr>
<td>Visual Reproduction (WMS subtest)</td>
<td>VR, VRI, VRII, Vis Rep</td>
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<td></td>
<td>Memory</td>
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<tr>
<td>Useful Field of View</td>
<td>UFOV</td>
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<td></td>
<td>Executive/Attention/Processing Speed</td>
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<tr>
<td>Walter Reed performance assessment battery</td>
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<tr>
<td>Wechsler Adult Intelligence Scale - multiple versions</td>
<td>WAIS, WAIS-R, WAIS-III, WAIS-IV</td>
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<td></td>
<td>Multidomain Neuropsychological Test Performance</td>
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<tr>
<td>Wechsler Memory Scale - multiple versions</td>
<td>WMS, WMS-R, WMS-III, WMS-IV</td>
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<td></td>
<td>Memory</td>
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<tr>
<td>Wisconsin Card Sorting Test</td>
<td>WCST</td>
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<td></td>
<td>Executive/Attention/Processing Speed</td>
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<tr>
<td>Instrument</td>
<td>Measurement Properties</td>
<td>Reliable Change Indices</td>
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<tr>
<td>Alzheimer’s Disease Assessment Scale-Cognitive subscale (ADAS-Cog)</td>
<td>Used to measure cognitive impairment in the assessment of Alzheimer’s disease. Tests several cognitive domains, including memory, language, and praxis. Range: 0-70; higher scores indicate worse cognition (22)</td>
<td>4pts (6 months); considered to be clinically important, but not meaningful; no established RCI’s (22)</td>
</tr>
<tr>
<td>Mini-Mental State Examination (MMSE)</td>
<td>11 items assessing cognitive function: orientation, registration, attention and calculation, recall, language (range 0-30) Range: 0-30; higher scores indicate better (23)</td>
<td>2.73pts (3 months) 3.60pts (5 years) (24)</td>
</tr>
<tr>
<td>Modified Mini-Mental State Examination (3MS)</td>
<td>15 items: 11 from MMSE plus 4 additional items assessing longterm memory, abstract thinking, category fluency, delayed recall Range: 0-100; higher scores indicate better cognition (23)</td>
<td>5pts (25) 7.41pts (3 months) 9.82pts (5 years) (24)</td>
</tr>
<tr>
<td>Telephone Interview for Cognitive Status (TICS)</td>
<td>11 items assessing word list memory, orientation, attention, repetition, conceptual knowledge, nonverbal praxis Range: 0-41; higher scores indicate better cognition(23)</td>
<td>None Identified</td>
</tr>
<tr>
<td>Tower Test</td>
<td>Varying number of items assessing spatial planning, rule learning, inhibition of impulsive and perseverative responding, and the ability to establish and maintain instructional set. Subjects must construct towers using 5 circular pieces, placed onto one of 3 pegs. Towers constructed must be identical to a picture shown. Subjects are not allowed to place a larger piece on a smaller piece, and must move one piece at a time. Range: 0-30 (26)</td>
<td>None Identified</td>
</tr>
<tr>
<td>Digit Span Forward*†</td>
<td>Varying number of items assessing attention efficiency and capacity: subjects asked to listen to a sequence of numbers read and then recite back in order (reported as either subscore or summary score with Digit Span Backward)</td>
<td>None Identified; part of WAIS-III WMI and VIQ</td>
</tr>
<tr>
<td>Digit Span Backward*†</td>
<td>Varying number of items assessing executive function and especially working memory: sequence of numbers read, participants asked to read sequence back in reverse order (reported as either subscore or summary score with Digit Span Forward)</td>
<td>None Identified; part of WAIS-III WMI and VIQ</td>
</tr>
<tr>
<td>Digit Symbol Substitution Test*</td>
<td>Varying number of items assessing psychomotor ability, sustained attention, processing speed and working memory: participants asked to use a key to substitute certain items within rows of numbers (Digit Symbol) or symbols (Symbol Digit Modalities) (score comprised of items completed within the specified time);</td>
<td>None Identified; part of WAIS-III PSI and PIQ</td>
</tr>
<tr>
<td>Stroop Interference Test</td>
<td>3 to 4 parts (depending on the version). Original version has 4 parts. Part 1: rows of written color names written in black ink, and the subject must say the written word. Part 2: the subject reads color names printed in colored ink, ignoring the printed color. Part 3: Subject names the colors of squares. Part 4: the subject uses the printed words from part 2, but must say the color of the ink each word is printed in instead of saying the word. Range: Time to completion and number of errors. Higher raw time and raw errors indicate worse cognition. (23)</td>
<td>None Identified</td>
</tr>
<tr>
<td>Instrument</td>
<td>Measurement Properties</td>
<td>Reliable Change Indices</td>
</tr>
<tr>
<td>------------</td>
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</tbody>
</table>
| Trail Making Test Part A (Trails A) | Assesses visual attention and processing speed: subject asked to draw lines connecting circled numbers in sequence (score comprised of both time to complete task and number of errors made; higher score indicates lower function, unless age-scaled score is presented)  
Range: Time, in seconds, required for completion; higher raw scores indicate worse cognition while higher scaled scores indicate better cognition. Additionally, if error rate is reported, then higher error rates indicate worse cognition. (23) | Scores to calculate RCI:  
T2-T1 mean, SD: -0.96, 7.54 (27)                                                                                   |
| Vigil/Continuous Performance Task (CPT) | Varying number of items assessing sustained and selective attention. Letters flash by one at a time on a computer screen. Subject must press the spacebar after they see an 'A' followed immediately by a 'K. (23) | None Identified                                                                                                                                                  |
| Wisconsin Card Sorting Test (WCST) | Cards are presented to the subject. Subject is told to match the cards, but not how to match; however, he or she is told whether a particular match is right or wrong. (23) | None Identified                                                                                                                                                  |
| Wechsler Adult Intelligence Scale (WAIS) | Published battery of neuropsychological tests with varying numbers of core and optional subtests. WAIS-III assesses Verbal Comprehension (Similarities, Vocabulary, Information); Working Memory (Digit Span, Arithmetic, [Letter-Number Sequencing], [Comprehension]); Perceptual Organization (Picture Completion, Block Design, Matrix Reasoning); and Processing Speed (Digit Symbol, [Symbol Search], [Picture Arrangement], [Object Assembly]). [Bracketed] subtests are optional. (23) | VIQ: 9pts  
PIQ: 11pts  
FSIQ: 9pts  
VCI: 11pts  
POI: 13pts  
WMI: 12pts  
PSI: 14pts  
(WAIS-III) (28)                                                                                         |
| Wechsler Memory Scale (WMS) | Published battery of neuropsychological tests with varying numbers of core and optional tests. WMS-III assesses auditory presentation (Logical Memory I and II, Verbal Paired Associates I and II, [Letter-Number Sequencing], [Information and Orientation], [Word Lists I and II], [Mental Control], [Digit Span]) and visual presentation (Faces I and II, Family Pictures I and II, [Spatial Span], [Visual Reproduction I and II]). (23) | None Identified                                                                                                                                                  |
| Benton Visual Retention Test (BVRT) | 10 items (designs) assessing visual memory and perception: subjects are shown one design at a time and asked to draw it from memory (score based on either correctness of drawing or number of errors made; higher error scores indicate lower function)  
Range: 0-10; higher scores indicate better cognition (23) | None Identified                                                                                                                                                  |
| Rey-Osterrich Complex Figure | 3 part test assessing visuospatial abilities, memory, attention, planning, and working memory (executive functions). Subject asked to reproduce a complicated line drawing 3 times: first by copying it while looking at the figure, second by reproducing it immediately afterwards from memory, and third by reproducing the figure again after a 20 to 30-minute delay (23) | Scores to calculate RCI:  
Copy T2-T1 mean, SD: -0.03, 1.76  
Immediate Recall T2-T1 mean, SD: 2.48, 4.51  
Delayed Recall T2-T1 mean, SD: 2.30, 4.32 (29)                                                      |
| Buschke Selective Reminding Test | 12 items in one list assessing verbal recall and recognition, with a possible 12 trials. List is read aloud until subject recalls all 12 words three times in a row, or until items are read 12 total times (whichever occurs first). After a 20 to 30-minute delay, subjects are asked to recall the 12 words again. Then a recognition trial may be given, which consists of a longer list of words that is read one word at a time; subjects respond ‘yes’ or ‘no’ if the word was on the original list of 12.  
Range: 0-12 for each trial and the recognition score, with higher scores indicating better cognition. Also an intrusion score for the recognition portion, counting each incorrect ‘yes’ given; higher scores indicate worse cognition(23) | None identified                                                                                                                                                  |
<table>
<thead>
<tr>
<th>Instrument</th>
<th>Measurement Properties</th>
<th>Reliable Change Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Verbal Learning Test (CVLT)</td>
<td>32 items in two lists (A &amp; B) of 16 words assessing verbal recall and recognition: List A is presented five times for learning and List B is presented once as a distractor. Range: Total Recall Score is 20-80; all other scores are z-scores -5 to +5; higher error and recency-recall index scores indicate worse cognition; all other higher scores indicate better cognition (23).</td>
<td>None Identified</td>
</tr>
<tr>
<td>Rey Auditory Verbal Learning Test (RAVLT)</td>
<td>30 items in two lists assessing verbal recall and recognition. First a list of 15 words is read aloud and subjects are asked to recall as many as possible (over 5 trials, with the list repeated each time). Then subjects are read a 15 word distractor list and asked to recall as many of the distractor words as possible (1 trial). Afterwards subjects are asked to recall as many of the original 15 words as possible (without being read the list). After a 20-minute delay period, subjects are asked to recall the original list of 15-words again (1 trial). Then a recognition trial may be given, which consists of a longer list of words that is read one word at a time; subjects respond ‘yes’ or ‘no’ if the word was on the original list of 15. Range: 0-15 for each trial (1-5, the distractor, delayed recall, and recognition) with higher scores indicating better cognition. Also an intrusion score for the recognition portion, counting each incorrect ‘yes’ given; higher scores indicate worse cognition (23).</td>
<td>(decline; improvement) Trial 1: -2.77; 2.65 Trial 5: -3.51; 2.63 Sum 1–5: -11.64; 9.36 Interference: -3.03; 3.11 Trial 7: -4.73; 3.57 Delay: -4.96; 3.60 Recognition: -3.47; 3.69 (12 months) (30)</td>
</tr>
<tr>
<td>Wechsler Adult Intelligence Scale (WAIS)</td>
<td>Published battery of neuropsychological tests with varying numbers of core and optional subtests. WAIS-III assesses Verbal Comprehension (Similarities, Vocabulary, Information); Working Memory (Digit Span, Arithmetic, [Letter-Number Sequencing], [Comprehension]); Perceptual Organization (Picture Completion, Block Design, Matrix Reasoning); and Processing Speed (Digit Symbol, [Symbol Search], [Picture Arrangement], [Object Assembly]). [Bracketed] subtests are optional. (23)</td>
<td>VIQ: 9pts PIQ: 11pts FSIQ: 9pts VCI: 11pts POI: 13pts WMI: 12pts PSI: 14pts (WAIS-III) (28)</td>
</tr>
<tr>
<td>Boston Naming Test (BNT)</td>
<td>60 items assessing word retrieval. Subjects are shown pictures and asked to name what they are pictures of, and receive semantic cues if needed. Range: 0-60; higher scores indicate better cognition (23).</td>
<td>4pts (9-15 months); 6pts (16-24 months) (31)</td>
</tr>
<tr>
<td>Verbal Fluency Test</td>
<td>Varying number of items assessing spontaneous verbal production: subjects asked to produce as many words beginning with a specific letter (phonemic/letter fluency) or as many words in a specific category such as “animals” (semantic/category fluency) as is possible in one minute. Range (phonemic fluency): sum of all admissible words for the three letters; higher scores indicate better cognition Range (semantic fluency): sum of all admissible words for the semantic categories; higher scores indicate better cognition (23)</td>
<td>(decline; improvement) Letter ‘S’: -5.5; 9.8 Animals: -7.6; 10.5 (1 month) (32)</td>
</tr>
</tbody>
</table>

*Subtest of WAIS
†Subtest of WMS

Abbreviations: 3MS= Modified Mini-Mental State Examination; BNT=Boston Naming Test; BVRT=Benton Visual Retention Test; CERAD=Consortium to Establish a Registry for Alzheimer’s Disease; CPT=Continuous Performance Task; CVLT=California Verbal Learning Test; DKEFS=Delis-Kaplan Executive Function System; FSIQ=Full Scale IQ; MMSE=Mini-Mental State Examination; PIQ=Performance IQ; POI=Perceptual Organization Index; PSI=Processing Speed Index; RCI=Reliable Change Index; RVT=Rey Verbal Learning Test; SDMT=Symbol Digit Modalities Test; TICS=Telephone Interview for Cognitive Status; Trails A= Trail Making Test Part A; Trails B= Trail Making Test Part B; VCI=Verbal Comprehension Index; VIQ=Verbal IQ; WAIS=Wechsler Adult Intelligence Scale; WMI=Working Memory Index; WMS=Wechsler Memory Scale
Part B. Supplement Figure. Literature Flow Diagram

Bibliographic database searches
11,087 references

Title and abstract review excluded
9,487 references

Hand search
185 references

Pulled for full text review
1,415 references

Excluded
1,381 references

Excluded population, intervention, or comparison = 581
Nonexperimental study design = 204
Inadequate followup time = 258
Not available in English = 22
Not intervention study = 194
No outcomes of interest = 66
Inadequate sample size = 45
Full text not available=11

Assessed for risk of bias
34 references

High risk of bias excluded
22 references

Included
11 studies (12 references)
### Part C. Data Tables for Adults with Normal Cognition

#### Supplement Table C1. Cognitive Training Interventions to Prevent Dementia in Adults with Normal Cognition: Eligible Trials, Intervention Descriptions, Inclusion Criteria, and Population Characteristics

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Country</th>
<th>Study Design</th>
<th>RoB</th>
<th>N=</th>
<th>Population Inclusion</th>
<th>Intervention Mode</th>
<th>Comparison Mode</th>
<th>Outcome Timing</th>
<th>Outcome Domain [Instrument]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corbett 2015(33)</td>
<td>UK</td>
<td>RCT</td>
<td>High</td>
<td>6742</td>
<td>Adults over 50 with access to a computer and internet Age, Mean (SD) 58.9 (6.5) 67% Female 97% White 50% University Graduate Baseline Cognition NR</td>
<td>Evidence-based reasoning and problem solving cognitive training or general cognitive training -10 minutes daily for 6 months</td>
<td>Internet-based tasks and games --10 minutes daily for 6 months</td>
<td>6 month</td>
<td>Executive/Attention/Processing Speed [Digit Vigilance, DSTask] Memory [PALS] [HVLT] [Spatial Working Memory]</td>
</tr>
<tr>
<td>Anderson 2014(34)</td>
<td>US</td>
<td>RCT</td>
<td>High</td>
<td>62</td>
<td>Adults age 55 to 70 years old Age, Mean (SD) 63 (4) 55% Female Race NR Education NR Baseline Cognition NR</td>
<td>Brain Fitness Program, a in-home auditory-based program of six modules to increase speed and accuracy of auditory processing -1 hour/day, 5 days/week for 8 weeks</td>
<td>In-home educational DVDs -1 hour/day, 5 days/week for 8 weeks</td>
<td>6 months</td>
<td>Executive/Attention/Processing Speed [Visual Matching Sub-test, Woodcock-Johnson III Tests of Cognitive Abilities] Memory [Memory for Words Sub-test, Woodcock-Johnson III Tests of Cognitive Abilities]</td>
</tr>
<tr>
<td>Lampit 2014(35)</td>
<td>Australia</td>
<td>RCT</td>
<td>High</td>
<td>80</td>
<td>Older adults without dementia who were able to use a computer and had an MMSE score greater than 23 Age, Mean (SD) 71 (6.2) 66% Female Race NR Education NR MMSE, Mean (SD) 28 (1.6)</td>
<td>Computerized cognitive training with 24 exercises providing training in the domains of memory, attention, response speed, executive functions and language -30-45 minute sessions, 3 times/week, over 12 weeks</td>
<td>National geographic videos and multiple choice questions after videos -30-45 minute sessions, 3 times/week, over 12 weeks</td>
<td>52 weeks</td>
<td>Multidomain Neuropsychological Performance [Global Cognition Composite] Executive/Attention/Processing Speed [Information Processing Speed Composite] [Executive Function Composite] Memory [Memory Composite] Language [Language Composite]</td>
</tr>
<tr>
<td>Stine-Morrow 2014(10)</td>
<td>US</td>
<td>RCT</td>
<td>Medium</td>
<td>461</td>
<td>Adults without dementia or neurological impairment Age, Mean (SD) 23 (7.6) 75% Female Race NR Education Level, Mean</td>
<td>Odyssey of the Mind engagement program –16 weekly meetings for 1.5 hours</td>
<td>Waitlist control</td>
<td>8 months</td>
<td>Executive/Attention/Processing Speed [Processing Speed Composite] Memory [Episodic Memory Composite] Visuospatial [Visuospatial Composite]</td>
</tr>
<tr>
<td>Study Design</td>
<td>Country</td>
<td>RoB</td>
<td>N=</td>
<td>Population</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Outcome</td>
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<td>Inclusion</td>
<td>Mode</td>
<td>Mode</td>
<td>Timing</td>
<td>Domain [Instrument]</td>
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<td>Age (mean)</td>
<td>Components</td>
<td>Components</td>
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<td>Sex (% female)</td>
<td>Frequency</td>
<td>Frequency</td>
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<td>Race (% White)</td>
<td>Duration</td>
<td>Duration</td>
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<td>Education (mean years)</td>
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<td>Baseline Cognition</td>
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<td>(SD)</td>
<td>supplemented with 6 packs of crossword and Sudoku puzzles</td>
<td>No contact control</td>
<td>6 months</td>
<td></td>
<td></td>
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<tr>
<td>Anguera 2013(36)</td>
<td>US</td>
<td>O'R</td>
<td>80</td>
<td>Treatment naïve older adults</td>
<td>Neuroracer, a three dimensional video game either in single-task or multi-tasking mode -1 hour/day, 3 times/week for 4 weeks</td>
<td>No contact control</td>
<td>6 months</td>
<td>Executive/Attention/Processing Speed, Memory</td>
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<td>Age, Mean (SD)</td>
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<td></td>
</tr>
<tr>
<td>Borness 2013(37)</td>
<td>Australia</td>
<td>High</td>
<td>135</td>
<td>Full and part time staff from an Australian national public service organization</td>
<td>Thirty-six online exercises across the domains of memory, attention, language, executive function and visuospatial abilities -20 minutes/sessions, 3 sessions/week, for 16 weeks</td>
<td>Videos about about the natural environment and answering multiple choice questions in a survey -20 minutes/sessions, 3 sessions/week, for 16 weeks</td>
<td>6 months</td>
<td>Executive/Attention/Processing Speed, Memory</td>
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<td>Age, Mean (SD)</td>
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<td>Carretti 2013(9)</td>
<td>Italy</td>
<td>Medium</td>
<td>40</td>
<td>Healthy older adults active in cultural and social activities in their neighborhood</td>
<td>Six individual training sessions over 2 weeks (sessions 2-4 were training, sessions 1, 5, and 6 were for baseline, posttest, and 6 month follow-up, respectively)</td>
<td>Paper-and-pencil questionnaires</td>
<td>6 months</td>
<td>Memory</td>
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<td>Baseline Cognition</td>
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<td>Study Design Country RoB</td>
<td>N=</td>
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<td>Interventions</td>
<td>Comparison Mode</td>
<td>Outcome Timing</td>
<td>Outcome Domain [Instrument]</td>
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<td>Miller 2013(8) RCT US Medium</td>
<td>84</td>
<td>Adults with no signs of dementia and a MMSE score of 24 or more</td>
<td>Computer brain fitness program -5 days a week for 20-25 minutes/day for 8 weeks followed by 4 months of doing as many sessions as they preferred</td>
<td>Wait-list control -2 months wait period prior to access to intervention for 4 months</td>
<td>6 months</td>
<td>Memory [Delayed Memory Composite] [Immediate Memory Composite] Language [Language Composite]</td>
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<tr>
<td>Wolinsky 2013(6) RCT US Low</td>
<td>681</td>
<td>Adults without a diagnosis of cognitive impairment</td>
<td>On-site visual speed of processing training with and without 2 hour boosters after 11 months -Five weekly, 2 hour training sessions At home visual speed of processing training -10 hours</td>
<td>On-site computerized crossword game –Five weekly, 2 hour training session</td>
<td>1 year</td>
<td>Executive/Attention/Processing Speed [UFOV] [TMT A] [TMT B] [SDMT] [SCWT (Word)] [SCWT (Color)] [SCWT (Color-Word)] [COWAT] [DVT, Time] [DVT, Errors]</td>
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<td>Cheng 2012(38) RCT China High</td>
<td>270</td>
<td>Older adults with no evidence of significant cognitive impairment</td>
<td>Multidomain training or reasoning training group cognitive training sessions –Twice a week for 12 weeks</td>
<td>Wait list control</td>
<td>6 months 12 months</td>
<td>Brief Cognitive Test Performance [MMSE] Multidomain Neuropsychological Performance [RBANS Total Score] [RBANS Attention] [SCWT (Interference)] [SCWT (Number of Naming Errors)] [TMT A] [TMT B] Memory [RBANS Immediate Memory] [RBANS Delayed Memory] [Visuospatial [RBANS Language] Visuospatial/Constructional]</td>
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<td>Mortimer 2012(39) RCT China High</td>
<td>75</td>
<td>Adults age 60-79 with an education-adjusted Chinese MMSE score greater than 26</td>
<td>Social interaction –Meeting at community center for 1 hour, 3 times/week</td>
<td>Inactive control with 4 check-in calls over 40 weeks</td>
<td>40 weeks</td>
<td>Biomarker [Whole Brain Volume, % of Total Intracranial Volume] Multidomain Neuropsychological Performance [Mattis Dementing Rating Scale, Total Score] Executive/Attention/Processing Speed [DS Forward] [DS Backward] [SCWT (Word)] [SCWT (Color)] [SCWT (Color-Word)] [WAIS Similarities] [TMT A] [TMT B] [Mattis Attention Score] [Mattis Initiation Score] [Mattis Conceptualization Score] Memory [AVLT, Immediate Recall] [AVLT, Delayed Recall]</td>
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<td>Study Design</td>
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<td>Szelag 2012(40)</td>
<td>Poland</td>
<td>High</td>
<td>30</td>
<td>Healthy adults between 65 and 75 years old</td>
<td>Temporal information processing training -32 hour-long sessions for 8 weeks</td>
<td>Non-temporal training using computer games or no intervention over 8 weeks</td>
<td>18 months</td>
<td>Executive/Attention/Processing Speed</td>
<td>[Attention Measure]</td>
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<tr>
<td>Evers 2011(41)</td>
<td>Germany</td>
<td>High</td>
<td>161</td>
<td>Women age 70 and over with no more than 4 errors on the MMSE</td>
<td>Computer course (writing, playing, calculating, surfing the Internet, emailing, drawing, image editing, and video taping)</td>
<td>Inactive control (live their habitual life)</td>
<td>6 months</td>
<td>Executive/Attention/Processing Speed</td>
<td>[SCWT]</td>
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<tr>
<td>Borella 2010(42)</td>
<td>Italy</td>
<td>High</td>
<td>40</td>
<td>Healthy adults with no pathologies causing possible cognitive impairments</td>
<td>Working memory training -360- minute sessions over 2 weeks</td>
<td>Memory questionnaires -360- minute sessions over 2 weeks</td>
<td>8 months</td>
<td>Executive/Attention/Processing Speed</td>
<td>[DS Forward] [DS Backward] [SCWT (Color Incongruent, RTs)] [SCWT (Color Control II, RTs)] [SCWT (Color Index, RTs)] [SCWT (Color Incongruent, Errors)] [SCWT (Color Control II, Errors)] [SCWT (Color Index, Errors)] [Pattern Comparison]</td>
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</table>

Baseline Cognition NR

Recall [AVLT, Delayed Recognition] [RCFT, Recall] [Mattis Memory Score]

Language [CVFT, Animals] [BNT]

Visuospatial [Bell Cancellation Test] [RCFT, Copying] [RCFT, Recall] [CLOX-1] [Mattis Construction Score]
<table>
<thead>
<tr>
<th>Study Design</th>
<th>Country</th>
<th>RoB</th>
<th>N=</th>
<th>Population Inclusion</th>
<th>Age (mean)</th>
<th>Sex (% female)</th>
<th>Race (% White)</th>
<th>Education (% mean years)</th>
<th>Baseline Cognition</th>
<th>Intervention Mode</th>
<th>Components</th>
<th>Frequency Duration</th>
<th>Comparison Mode</th>
<th>Components</th>
<th>Frequency Duration</th>
<th>Outcome Timing</th>
<th>Outcome Domain [Instrument]</th>
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</thead>
<tbody>
<tr>
<td>Klusmann, 2010(7)</td>
<td>Germany</td>
<td>Medium</td>
<td>168</td>
<td>Women older than 70 without cognitive impairment</td>
<td>Age, Mean (SD) 74 (4)</td>
<td>100% Female</td>
<td>Race NR</td>
<td>Years Education, Mean (SD) 12 (2.6)</td>
<td>MMSE, Mean (SD) 28.8 (0.97)</td>
<td>Computer courses focusing on creative tasks and coordinative and memory tasks -75 intervention units of 90 minutes over 6 months</td>
<td>Living habitual life over 6 months</td>
<td>6 months</td>
<td>Executive/Attention/Processing Speed [TMT A/B] [SCWT] Memory [RBMT, Immediate] [RBMT, Delayed Recall] [FCSRT, Short Delay] [FCSRT, Long Delay]</td>
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<tr>
<td>McDougall 2010(43)</td>
<td>US</td>
<td>High</td>
<td>265</td>
<td>Non-demented older adults</td>
<td>Age, Mean 75</td>
<td>79% Female</td>
<td>71% White</td>
<td>Education, Mean (SD) 13.6 (3.8)</td>
<td>Baseline Cognition MMSE, Mean 28.8</td>
<td>Small group memory training -2 times/week for a month, 12 hours total with 4, 2-hour booster sessions over 3 months following training</td>
<td>Health promotion training focusing on 18 topics -2 times/week for a month, 12 hours total with 4, 2-hour booster sessions over 3 months following training</td>
<td>6 months</td>
<td>14 months</td>
<td>26 months</td>
<td>Brief Cognitive Test Performance [MMSE] Memory [RBMT] [BVMT, Delayed Recall] [HVLT, Delayed Recall]</td>
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<tr>
<td>Park 2009(44)</td>
<td>South Korea</td>
<td>High</td>
<td>129</td>
<td>Adults age 65 and over without clinically significant diseases</td>
<td>Age, Mean (SD) 78.3 (6.22)</td>
<td>93% Female</td>
<td>Race NR</td>
<td>Years Education, Mean (SD) 4.62 (4.33)</td>
<td>MMSE, Mean (SD) 22.14 (4.61)</td>
<td>Cognitive training program -12, 60-minute sessions followed by an observational period</td>
<td>Delayed cognitive training program -8 weeks of observation followed by cognitive training program</td>
<td>24 weeks</td>
<td>Brief Cognitive Test Performance [MMSE]</td>
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<tr>
<td>Slegers 2009(45)</td>
<td>Netherlands</td>
<td>High</td>
<td>191</td>
<td>Healthy older adults with no prior computer experience</td>
<td>Age NR</td>
<td>Sex NR</td>
<td>Race NR</td>
<td>Education NR</td>
<td>Small group practice with personal computer following by at home practice with a personal computer with at home assignments -4 hour training sessions over 2 weeks followed by home</td>
<td>No training/no intervention</td>
<td>12 months</td>
<td>Brief Cognitive Test Performance [Cognitive Failures Questionnaire] Executive/Attention/Processing Speed [Letter-Digit Substitution Test] [SCWT] Memory [Visual Verbal Learning Test] Motor [Motor Choice RT]</td>
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<td>Study Design</td>
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<td>Population Inclusion</td>
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<td>Outcome Timing</td>
<td>Outcome Domain [Instrument]</td>
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<td><strong>Buiza 2008</strong>(46)</td>
<td>Spain</td>
<td>238</td>
<td>Adults age 65 and over without cognitive impairment Age, Mean (SD) 74 (8) 73% Female Race NR Education NR Baseline Cognition NR</td>
<td>Structured and unstructured cognitive training with and without information on well-being – Weekly sessions with 180 sessions over 2 years</td>
<td>No training (regular daily activities)</td>
<td>1 year 2 years</td>
<td>Executive/Attention/Processing Speed [Abstraction] [TMT A] [Phon-Phonetic Fluency Execution] [Ideomotor Praxia] Memory [Immediate Memory, WMS] [Recent Logical Execution Memory, AVLT] [Short Term Memory] [Working Memory] Language [Ideomotor Praxia]</td>
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<td><strong>Buschkuehl 2008</strong>(47)</td>
<td>Switzerland</td>
<td>39</td>
<td>High-functioning without any severe psychiatric problems Age, Mean (SD) 80 (3.3) 59% Female Race NR Education NR Baseline Cognition NR</td>
<td>Working memory training - 45 minute sessions, 2 sessions/week for 12 weeks</td>
<td>Physical training with an eccentric bicycle ergometer - 45 minute sessions, 2 sessions/week for 12 weeks</td>
<td>1 year</td>
<td>Executive/Attention/Processing Speed [DSST] Memory [Verbal Free Recall] [Visual Free Recall] Visuospatial [Block-Span Task]</td>
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<td><strong>Yesavage 2008</strong>(48)</td>
<td>US</td>
<td>168</td>
<td>Community-dwelling adults aged 55-90 with a MMSE score between 24 and 30 Age, Mean (SD) 65 (8) 52% Female Race NR Education, Mean (SD) 16.3 (2.3) MMSE, Mean (SD) 28.6 (1.2)</td>
<td>Daily dose of 5 mg of Donepezil for 6 weeks, then increased to 10mg daily for 46 weeks; 2 weeks of cognitive training at weeks 13-14</td>
<td>Placebo and 2 weeks of cognitive training at weeks 13-14</td>
<td>1 year</td>
<td>Executive/Attention/Processing Speed [DSST] Memory [Word List Recall] [Name-Face Recall] [Logical Memory I Score] [Logical Memory II Score]</td>
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<td><strong>Oswald 2006</strong>(49)</td>
<td>Germany</td>
<td>375</td>
<td>Adults age 75+ living independently Age, Mean (SD) 79.5 (3.5) 64.8% Female Race NR Education</td>
<td>Group cognitive training sessions consisting of memory, attention, and processing speed training - 30 weekly sessions, 90-minutes each</td>
<td>Psychoeducational training focused on coping skills, fall prevention, nutrition, and financial resources - 30 weekly sessions, 90-minutes each</td>
<td>5 years</td>
<td>Multidomain Neuropsychological Performance [Cognitive Function Composite] [Cognitive Impairment Composite]</td>
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<td>Study Design Country</td>
<td>N=</td>
<td>Population Inclusion Age (mean) Sex (% female) Race (% White) Education (mean years) Baseline Cognition</td>
<td>Intervention Mode Components Frequency Duration</td>
<td>Comparison Mode Components Frequency Duration</td>
<td>Outcome Timing</td>
<td>Outcome Domain [Instrument]</td>
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<td>Rebok 2014(18) RCT US High</td>
<td>2832</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22 Age, Mean (SD) 74 (6) 76% Female 73% White 88.6% High School Graduate MMSE, Mean (SD) 27.2 (2.0)</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>10 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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<td>Rebok 2013(50) RCT US High</td>
<td>629</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22 Age, Mean (SD) 73.5 (6.0) 77% Female 76% White Years Education, Mean (SD) 13.7 (2.7) MMSE, Mean (SD) 27.3 (2)</td>
<td>Verbal episodic memory training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>1 year</td>
<td>Memory [Memory Composite]</td>
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<td>Jones, 2013(51) RCT US High</td>
<td>1659</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22 Age, Mean (SD) 74 (6) 77% Female 73% White Education, Mean (SD)</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>5 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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<td>Study Design Country RoB</td>
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<td>Outcome Domain [Instrument]</td>
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<td>Sisco 2013(52) RCT US High</td>
<td>1912</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>1 year 2 years 3 years 5 years</td>
<td>Memory [Rivermead Paragraph Recall Test, Verbatim Recall] [Rivermead Paragraph Recall Test, Paraphrase Recall] [HVLT, Total Recall] [AVLT, Total Recall]</td>
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<td>Valdes 2012(53) RCT US High</td>
<td>195</td>
<td>Older adults from ACTIVE trial with psychometrically-defined MCI</td>
<td>Speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>10 years</td>
<td>Executive/Attention/Processing Speed [UFOV Performance]</td>
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<td>Unverzagt 2012(54) RCT US High</td>
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<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>5 years</td>
<td>Diagnosis [Dementia]</td>
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<td>Country</td>
<td>N=</td>
<td>Population Inclusion</td>
<td>Intervention Mode</td>
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<tr>
<td>Wolinsky, 2010(55)</td>
<td>RCT</td>
<td>US</td>
<td>1534</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>5 years</td>
<td>Executive/Attention/Processing Speed [Internal Locus of Control] [Chance Locus of Control] [Powerful Others Locus of Control]</td>
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<td>Wolinsky, 2010b(56)</td>
<td>RCT</td>
<td>US</td>
<td>1804</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>2 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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<tr>
<td>Unverzagt 2007(57)</td>
<td>RCT</td>
<td>US</td>
<td>2832</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training -10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>2 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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<td>Study Design Country RoB</td>
<td>N=</td>
<td>Population Inclusion</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Outcome</td>
<td>Outcome Domain [Instrument]</td>
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<td>Age (mean)</td>
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<td>Timing</td>
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<td>Sex (% female)</td>
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<td>Baseline Cognition</td>
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<td>MMSE, Mean (SD)</td>
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<td></td>
<td>Verbal episodic memory</td>
<td>training or reasoning training or speed of processing training</td>
<td>-10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>5 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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<tr>
<td>Willis 2006(17) US RCT High</td>
<td>2832</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Age, Mean (SD) 74 (6) 76% Female 73% White 88.6% High School Graduate MMSE, Mean (SD) 27.2 (2.0)</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training</td>
<td>-10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>2 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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<tr>
<td>Ball 2002(5) RCT US Medium</td>
<td>2832</td>
<td>Older adults aged 65 to 94 years with good functional and cognitive status and a MMSE score greater than 22</td>
<td>Age, Mean (SD) 74 (6) 76% Female 73% White 88.6% High School Graduate MMSE, Mean (SD) 27.2 (2.0)</td>
<td>Verbal episodic memory training or reasoning training or speed of processing training</td>
<td>-10 small group sessions, 60-75 minutes each over 5 to 6 weeks</td>
<td>No contact control group (study duration)</td>
<td>2 years</td>
<td>Executive/Attention/Processing Speed [Reasoning Composite] [Speed of Processing Composite] Memory [Memory Composite]</td>
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AVLT=Auditory Verbal Learning Test; BNT=Boston Naming Test; BVMT= brief Visuospatial Memory Test; BVRT=Benton Visual Retention Test; CLOX-1=Clock Drawing Test; COWAT= Controlled Oral Word Association Test; DS=Digit Span (Forward and/or Backward); DVT=Digit Vigilance Test; FCSRT= Free and Cued Selective Reminding Test; HVLT=Hopkins Verbal Learning Test; MCI=mild cognitive impairment; MMSE=Mini Mental Status Exan; N=sample size; PALS=Paired Association Learning Test; RBANS=Repeatable Battery for Neuropsychological Status; RBMT= Rivermead Behavioral Memory Test; RCFT=Rey-Osterrieth Complex Figure Test; RCT=randomized controlled trial; RoB=risk of bias; RT=Reaction Time; SCWT=Stroop Color Word Test; SD=standard deviation; SDMT=Symbol Digit Modalities Test; SOE=strength of evidence; TMT=Trail Making Test (Part A and/or B); UFOV=Useful Field of View; US=United States; ACTIVE=Advanced Cognitive Training for Independent and Vital Elderly; AVLT=Auditory Verbal Learning Test; HVLT=Hopkins Verbal Learning Test; MCI=Mild Cognitive Impairment; MMSE=Mini Mental Status Exam; RCT=Randomized Controlled Trial; RoB=Risk of Bias; SD=Standard Deviation
**Supplement Table C2. Summary risk-of-bias assessments: other cognitive training trials in adults with normal cognition.**

<table>
<thead>
<tr>
<th>Study Funding</th>
<th>Overall Risk of Bias Assessment</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corbett 2015(33)</td>
<td>High</td>
<td>Suspected selection bias due to process for participant recruitment and attrition bias due to attrition rate of over 40%.</td>
</tr>
<tr>
<td>Anderson 2014(34)</td>
<td>High</td>
<td>Process for randomization is unclear and attrition rate is 22% with no analysis to address potential bias.</td>
</tr>
<tr>
<td>Lampt 2014(35)</td>
<td>High</td>
<td>Attrition rate is 31% with no analysis to address potential bias.</td>
</tr>
<tr>
<td>Stine-Morrow 2014(10) Government</td>
<td>Medium</td>
<td>Process for randomization is unclear with potential attrition bias.</td>
</tr>
<tr>
<td>Anguera 2013(36)</td>
<td>High</td>
<td>Suspected selection, attrition, and detection bias.</td>
</tr>
<tr>
<td>Borness 2013(37) Industry</td>
<td>High</td>
<td>Process for randomization is unclear and attrition rate is 35% with no analysis to address potential bias.</td>
</tr>
<tr>
<td>Carretti 2013(9) Not Reported</td>
<td>Medium</td>
<td>Process for randomization is unclear with potential performance bias.</td>
</tr>
<tr>
<td>Miller 2013(8) Industry</td>
<td>Medium</td>
<td>Process for randomization is unclear with potential attrition bias.</td>
</tr>
<tr>
<td>Wolinsky 2013(6) Government</td>
<td>Low</td>
<td>No suspected biases</td>
</tr>
<tr>
<td>Cheng 2012(38) Government</td>
<td>High</td>
<td>Potential attrition bias with attrition rate of 40%.</td>
</tr>
<tr>
<td>Mortimer 2012(39) Non-government</td>
<td>High</td>
<td>Potential selection bias due to process for randomization</td>
</tr>
<tr>
<td>Szelag 2012(40) Government</td>
<td>High</td>
<td>Potential selection and attrition bias.</td>
</tr>
<tr>
<td>Evers 2011(41) Not Reported</td>
<td>High</td>
<td>Potential selection, attrition, and performance bias.</td>
</tr>
<tr>
<td>Borella 2010(42) Not Reported</td>
<td>High</td>
<td>Process for randomization is unclear and potential detection bias.</td>
</tr>
<tr>
<td>Klusmann 2010(7) Government</td>
<td>Medium</td>
<td>Process for randomization is unclear with potential attrition bias.</td>
</tr>
<tr>
<td>McDougall 2010(43) Government</td>
<td>High</td>
<td>Potential attrition and reporting bias.</td>
</tr>
<tr>
<td>Park 2009(44) Government</td>
<td>High</td>
<td>Process for randomization is unclear with potential attrition and reporting bias.</td>
</tr>
<tr>
<td>Siegers 2009(45) Government</td>
<td>High</td>
<td>Potential reporting bias and selection bias due to process for selecting participants.</td>
</tr>
<tr>
<td>Buschkuehl 2008(47) Government</td>
<td>High</td>
<td>Attrition bias with an attrition rate is 44%.</td>
</tr>
<tr>
<td>Yesavage 2008(48) Government</td>
<td>High</td>
<td>Potential attrition bias with attrition rate of 29%.</td>
</tr>
<tr>
<td>Oswald 2006(49) Not Reported</td>
<td>High</td>
<td>Suspected selection bias due to process for randomization.</td>
</tr>
<tr>
<td>Rebok 2014(18) Government/University</td>
<td>High</td>
<td>Potential attrition bias with attrition rate of 57%.</td>
</tr>
<tr>
<td>Rebok 2013(50) Government/University</td>
<td>High</td>
<td>Potential attrition and reporting bias.</td>
</tr>
<tr>
<td>Study Funding</td>
<td>Overall Risk of Bias Assessment</td>
<td>Rationale</td>
</tr>
<tr>
<td>---------------------</td>
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<tr>
<td>Jones 2013(51)</td>
<td>High</td>
<td>Attrition rate is greater than 21% with insufficient analysis to address potential for bias.</td>
</tr>
<tr>
<td>Sisco 2013(52)</td>
<td>High</td>
<td>Attrition rate is 33% with insufficient analysis to address potential for bias.</td>
</tr>
<tr>
<td>Valdes 2012(53)</td>
<td>High</td>
<td>Potential attrition and reporting bias.</td>
</tr>
<tr>
<td>Unverzagt 2012(54)</td>
<td>High</td>
<td>Attrition rate is 33% with insufficient analysis to address potential for bias.</td>
</tr>
<tr>
<td>Wolinsky 2010(55)</td>
<td>High</td>
<td>Potential attrition bias with attrition rate of 55%.</td>
</tr>
<tr>
<td>Wolinsky 2010b(56)</td>
<td>High</td>
<td>Attrition rate is 36% with insufficient analysis to address potential for bias.</td>
</tr>
<tr>
<td>Unverzagt 2007(57)</td>
<td>High</td>
<td>Attrition rate is greater than 21% with insufficient analysis to address potential for bias.</td>
</tr>
<tr>
<td>Willis 2006(17)</td>
<td>High</td>
<td>Attrition rate is 33% with insufficient analysis to address potential for bias.</td>
</tr>
<tr>
<td>Ball 2002(5)</td>
<td>Medium</td>
<td>Potential attrition and detection bias.</td>
</tr>
</tbody>
</table>

1 Risk of bias assessments are for all extracted outcomes unless otherwise noted.
### Supplement Table C3. Cognitive Training Interventions to Prevent Dementia in Adults with MCI: Eligible Trials, Intervention Descriptions, Inclusion Criteria, and Population Characteristics

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Country</th>
<th>RoB</th>
<th>N=</th>
<th>Population Inclusion</th>
<th>Intervention Mode</th>
<th>Comparison Mode</th>
<th>Outcome timing</th>
<th>Outcome Domain [Instrument]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baekatain 2017 RCT</td>
<td>Iran</td>
<td>High</td>
<td>51</td>
<td>Adults age 60+ with at least five years of education and a diagnosis of nonamnestic MCI. Age, Mean (SD) 65.3 (4.8) 88% Female Race NR Education 63% with a University Education Baseline Cognition NR</td>
<td>Group cognitive rehabilitation focused on attention processing training, goal management therapy, problem-solving therapy, and metacognitive therapy on how to organize and achieve goals -2 hours/week for 8 weeks</td>
<td>Educational pamphlets at the end of the study</td>
<td>6 months</td>
<td>Brief Cognitive Test Performance [MMSE] Executive/Attention/Processing Speed [Behavioral Rating Inventory of Executive Function] [Go/No-go Test] [Color Trials Test] [Tower of London] [Five Point] Visuospatial [Design Fluency] Memory [Category Fluency]</td>
</tr>
<tr>
<td>Jeong 2016(58) RCT</td>
<td>South Korea</td>
<td>High</td>
<td>195</td>
<td>Adults age 50-85 diagnosed with aMCI using Petersen criteria Age, Mean (SD) 70.3 (11) 63% Female Race NR Education, Mean (SD) 9.8 (4.4) MMSE, Mean (SD) 25.7 (2.5)</td>
<td>Group-based cognitive intervention -90 minute sessions, 2 times/week for 12 weeks</td>
<td>Wait list control</td>
<td>6 months</td>
<td>Diagnosis [CDR, Sums of Boxes] Brief Cognitive Test Performance [MMSE] Multidomain Neuropsychological Test Performance [ADAS-Cog] Executive/Attention/Processing Speed [Executive Function Composite] Memory [Logical Memory Composite] [Working Memory Composite] [Prospective Memory Test]</td>
</tr>
<tr>
<td>Jeong 2016(58) RCT</td>
<td>South Korea</td>
<td>High</td>
<td>197</td>
<td>Adults age 50-85 diagnosed with aMCI using Petersen criteria Age, Mean (SD) 70.3 (11) 63% Female Race NR Education, Mean (SD) 9.8 (4.4) MMSE, Mean (SD) 25.7 (2.5)</td>
<td>Home-based cognitive intervention that involved homework materials (memory tasks) to be completed 5 days/week for 12 weeks</td>
<td>Wait list control</td>
<td>6 months</td>
<td>Diagnosis [CDR, Sums of Boxes] Brief Cognitive Test Performance [MMSE] Multidomain Neuropsychological Test Performance [ADAS-Cog] Executive/Attention/Processing Speed [Executive Function Composite] Memory [Logical Memory Composite] [Working Memory Composite] [Prospective Memory Test]</td>
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<tr>
<td>Study Design</td>
<td>Country</td>
<td>N=</td>
<td>Population</td>
<td>Inclusion</td>
<td>Age (mean)</td>
<td>Sex (% female)</td>
<td>Race (% White)</td>
<td>Education (mean years)</td>
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<td>Lam 2015(59)</td>
<td>RCT China High</td>
<td>277</td>
<td>Chinese older adults with MCI (presence of subjective cognitive complaints and objective impairments in cognitive function)</td>
<td>Age, Mean (SD) 75.4 (6.5) 78.2% Female Race</td>
<td>Education, Mean (SD) 3.9 (3.6) ADAS-cog, Mean (SD) 11.5 (3.3)</td>
<td>Cognitive and mind-body exercises - 1 hour sessions 3 times/week</td>
<td>Cognitively demanding activities (e.g., reading and discussing news, board games) – At least 3 sessions/weeks</td>
<td>8 months 12 months</td>
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<tr>
<td>Moro 2015(60)</td>
<td>Crossover RCT Italy High</td>
<td>30</td>
<td>Adults with MCI diagnosed with Mayo criteria</td>
<td>Age, Mean (SD) 74.8 (6.7) Sex NR Race NR</td>
<td>Education, Mean (SD) 9.6 (4) MOCA, Mean (SD) 24.4 (3.7)</td>
<td>Individualized cognitive training program for 6 months followed by 6 months of no intervention - 2 sessions/week for 2 months followed by 1 session/week for 4 months</td>
<td>No intervention for 6 months followed by 6 months of an individualized cognitive training program - 2 sessions/week for 2 months followed by 1 session/week for 4 months</td>
<td>6 months 12 months</td>
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<tr>
<td>Vidovich 2015(11)</td>
<td>RCT US Low (52 weeks) High (104 Weeks)</td>
<td>150</td>
<td>Adults age 65 years and older with MCI</td>
<td>Age, Mean (SD) 75 (6) 54% Female</td>
<td>80% With High School Education</td>
<td>Cognitive activity training program (attention, memory, and executive processes) - 10, 90-minute sessions/week over 5 weeks; Booster telephone call at 6 months</td>
<td>Education about healthy aging - 10, 90-minute sessions/week over 5 weeks; Booster telephone call at 6 months</td>
<td>52 weeks 104 weeks</td>
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<tr>
<td>Fiatarone Singh 2014(61)</td>
<td>RCT Australia High</td>
<td>51</td>
<td>Adults age 55 and older with a MCI diagnosis consistent with Petersen criteria</td>
<td>Age NR Sex NR</td>
<td>Education NR</td>
<td>Cognitive training (computer-based exercises targeting memory, executive function, attention, and processing speed) - 100</td>
<td>Sham cognitive training and sham exercise</td>
<td>6 months 18 months</td>
</tr>
<tr>
<td>Study Design Country</td>
<td>N=</td>
<td>Population Inclusion Age (mean) Sex (% female) Race (% White) Education (mean years) Baseline Cognition</td>
<td>Intervention Mode Components Frequency Duration</td>
<td>Comparison Mode Components Frequency Duration</td>
<td>Outcome Domain [Instrument]</td>
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<tr>
<td>Kwok 2013 (12) RCT China Medium</td>
<td>223</td>
<td>Chinese adults aged 65 and over with subjective memory complaints Age, Mean (SD) 75 (6) 85% Female Race NR 70% Below or at primary level education MMSE. Mean (SD) 25.6 (2.6)</td>
<td>MMSE, Mean (SD) 27 (1) minutes 2 days/week for 6 months</td>
<td>Cognitive therapy delivered by an occupation therapist 1 time/week, 1.5 hours each session for 12 weeks Health-related educational lectures for 12 weeks, delivered by occupational therapist</td>
<td>Memory [List learning Memory Sum from ADAS-Cog] Memory [BVRT] [Logical Memory, Immediate] [Logical Memory, Delayed] [Memory Domain Composite] Language [Category Fluency, Animal Naming] [COWAT]</td>
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<td>Rojas 2013 (62) RCT Argentina High</td>
<td>46</td>
<td>Adults with MCI based on Petersen’s criteria Age, Mean (SD) 74 (10.7) 43% Female Race NR Education Level, Mean (SD) 10.54 (3.8) MMSE. Mean (SD) 27.3 (2)</td>
<td>Group cognitive stimulation training sessions and cognitive training –120 minutes/week over 6 months</td>
<td>Routine treatment with monthly consultations with doctor over 6 months</td>
<td>Diagnosis [CDR] Brief Cognitive Test Performance [MMSE] Executive/Attention/Processing Speed [Attention Composite] [Initiation/Perseveration] [Conceptualization] Memory [Memory Composite]</td>
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<tr>
<td>Buschert 2012 (13) Forster 2011 (14) RCT Germany Medium</td>
<td>24</td>
<td>Participants with aMCI based on Petersen’s criteria Age, Mean (SD) 73 (6.6) 55% Male Race NR Years Education, Mean (SD) 12.8 (5) MMSE, Mean (SD) 26.3 (2)</td>
<td>Group-based formal mnemonic memory training and informal cognitive and social engagement activities - 120 minutes/week for 6 months</td>
<td>Exercises of isolated, sustained attention – Monthly sessions for 8 months followed by cross-over to intervention</td>
<td>Diagnosis [Conversion to Alzheimer’s Disease] Biomarker [FDG-PET Reuptake] Brief Cognitive Test Performance [MMSE] Multidomain Neuropsychological Performance [ADAS-Cog] Executive/Attention/Processing Speed [TMT A/B] Memory [RBANS Memory] [RBANS, Story Recall]</td>
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<tr>
<td>Study Design Country RoB</td>
<td>N=</td>
<td>Population Inclusion</td>
<td>Intervention Mode</td>
<td>Comparison Mode</td>
<td>Outcome timing</td>
<td>Outcome Domain [Instrument]</td>
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<tr>
<td>Herrera 2012(15) RCT France Medium</td>
<td>22</td>
<td>Adults with a MCI based on Petersen’s criteria Age, Mean (SD) 77 (1.7) 50% Female Race NR 14% With more than Secondary School MMSE. Mean (SD) 27.4 (0.5)</td>
<td>Computer-based memory and attention training -24, 1-hour sessions over 12 weeks</td>
<td>Cognitive activities (e.g., organizing lists, reading comprehension -24, 1-hour sessions over 12 weeks</td>
<td>6 months</td>
<td>Executive/Attention/Processing Speed [DS Forward] [DS Backward] Memory [Doors Recognition Subtest, Set A] [Doors Recognition Subtest, Set B] [DMS48 Test] [BEM-144 Word List Recall] [16-Item Free and Cued Reminding Test] [MMSE, Recall of 3 Words] [RCFT, Recall]</td>
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<tr>
<td>Moro 2012(60) RCT Italy High</td>
<td>Adults with a MCI Age, Mean (SD) 71 (8) Sex NR Race NR Education, Mean (SD) 10 (3.5) Baseline Cognition NR</td>
<td>Individual cognitive training sessions- 3 sessions/week for one month. 1 session/week (at home with support of caregiver) for the subsequent 5 months.</td>
<td>No intervention for 6 months (crossover design)</td>
<td>6 months 12 months</td>
<td>Executive/Attention/Processing Speed [Attentional Matrices] [TMT A] [Bourdon Test] [Verbal Span] [Tower of London] [Analogenies] [SCWT] [TMT B/A] Memory [AVLT, Immediate Recall] [AVLT, Delayed Recall] [Omissions] [False Recognitions] [Listening Span Test] [Story Recall] Language [CVFT]</td>
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<tr>
<td>Rapp 2002(16) RCT US Medium</td>
<td>19</td>
<td>Older adults meeting criteria for MCI based on Petersen’s criteria Age, Mean (SD) 74 (6.8) 58% Female 95% White 37% With Some College MMSE. Mean (SD) 27.6 (1.7)</td>
<td>Memory training and education –Six weekly, 2 hour group meetings with homework assignments</td>
<td>No memory education or training (no intervention)</td>
<td>6 months</td>
<td>Memory [Word List, Immediate] [Word List Delayed] [Shopping List Immediate] [Shopping List Delayed] [Names and Faces Immediate] [Names and Faces Delayed] [Paragraph, Immediate] [Paragraph, Delayed]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ADAS=Cognitive Assessment Scale; AVLT=Auditory Verbal Learning Test; BNT=Boston Naming Test; BVRT=Benton Visual Retention Test; CAMCOG=Cambridge Cognition Examination; CDR=Clinical Dementia Rating; COWAT=Controlled Oral Word Association Test; CVFT=Category Verbal Fluency Test; CVLT=California Verbal Learning Test; DS=Digit Span (Forward and/or Backward); MCI=mild cognitive impairment; MMSE=Mini-Mental Status Examination; MRI=magnetic resonance imaging; N=sample size; NR=not reported; RBMT=Rivermead Behavioral Memory Test; RCFT=Rey-Osterrieth Complex Figure Test; RCT=randomized controlled trial; RoB=risk of bias; RT=Reaction Time; SCWT=Stroop Color Word Test; SD=standard deviation; SOE=strength of evidence; TMT=Trail Making Test (Part A and/or B); UEO=Useful Field of View; US=United States; VP=Verbal Proficiency; VR=Visual Reproduction; VRM=Verbal Recognition Memory; WAIS=Wechsler Adult Intelligence Scale; WMS=Wechsler Memory Scale
# Supplement Table C4. Summary risk-of-bias assessments: other cognitive training trials in adults with MCI

<table>
<thead>
<tr>
<th>Study Funding</th>
<th>Overall Risk of Bias Assessment</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baekatain 2017 University</td>
<td>High</td>
<td>Suspected bias due to unclear reporting of attrition and results.</td>
</tr>
<tr>
<td>Jeong 2016(58) Government</td>
<td>High</td>
<td>Attrition rate is 33% with no analysis to address potential bias.</td>
</tr>
<tr>
<td>Lam 2015(59) Non-government</td>
<td>High</td>
<td>Potential selection bias with attrition greater than 21%</td>
</tr>
<tr>
<td>Moro 2015(60) Government</td>
<td>High</td>
<td>Suspected selection bias, unclear attrition, and suspected detection bias.</td>
</tr>
<tr>
<td>Vidovich 2015(11) Non-government</td>
<td>Low (52 Weeks) High (104 weeks)</td>
<td>Attrition rate greater than 21% at 104 weeks with no analysis to address potential bias.</td>
</tr>
<tr>
<td>Fiatarone Singh 2014(61) Government</td>
<td>High</td>
<td>Potential reporting bias.</td>
</tr>
<tr>
<td>Rojas 2013(62) Government</td>
<td>High</td>
<td>Potential selection bias with an attrition rate of 35%.</td>
</tr>
<tr>
<td>Buschert 2012(13) Non-government</td>
<td>Medium</td>
<td>Process for randomization is unclear.</td>
</tr>
<tr>
<td>Herrera 2012(15) Not Reported</td>
<td>Medium</td>
<td>Process for randomization is unclear with potential detection bias.</td>
</tr>
<tr>
<td>Moro 2012(60) Non-government</td>
<td>High</td>
<td>Potential selection, detection, and performance bias.</td>
</tr>
</tbody>
</table>

1 Risk of bias assessments are for all extracted outcomes unless otherwise noted.
References


