

Supplementary material 1 Search strategies for Medline and Embase - Strategies for the other databases can be obtained by the correspondent author

Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present. Search date: 10 February 2017

- 1 Amyotrophic Lateral Sclerosis/ (15384)
- 2 Motor Neuron Disease/ (3940)
- 3 (amyotrophic or lateral sclerosis* or ALS or motor neuron disease or motor neurone disease or MND or gehrig*).ti,ab,kw. (31209)
- 4 frontotemporal lobar degeneration/ or exp frontotemporal dementia/ (2961)
- 5 (frontotemporal dementia or FTD or (frontotemporal adj2 degeneration) or FTLD or (Pick* adj2 disease) or frontal variant dementia or bv-FTD or f-FTD or presenile dementia).ti,ab,kw. (9778)
- 6 1 or 2 or 3 or 4 or 5 (42564)
- 7 exp cognition/ or executive function/ (136893)
- 8 cognition disorders/ or mild cognitive impairment/ (63818)
- 9 exp Language Disorders/ (44063)
- 10 exp Behavior/ (1433527)
- 11 (cognit* or language disorder* or verbal fluency or verbal memory or executive or behavior* or behaviour*).ti,ab,kw. (1218771)
- 12 7 or 8 or 9 or 10 or 11 (2365995)
- 13 (index or instrument or instruments or questionnaire or questionnaires or scale or scales or screen or test or tests or battery or batteries or inventory or examination or rating form or rating forms or assessment or assessments or checklist or checklists or interview or interviews).ti,ab,kw. (4081828)
- 14 6 and 12 and 13 (2966)
- 15 limit 14 to animals (236)
- 16 limit 15 to humans (127)
- 17 14 not (15 not 16) (2857)
- 18 limit 17 to "all child (0 to 18 years)" (273)
- 19 limit 17 to "all adult (19 plus years)" (1946)
- 20 17 not (18 not 19) (2743)

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <1946 to December 16, 2019>, Search date: 17 Dec. 2019

- 1 Amyotrophic Lateral Sclerosis/ (18182)
- 2 Motor Neuron Disease/ (4248)
- 3 (amyotrophic or lateral sclerosis* or ALS or motor neuron disease or motor neurone disease or MND or gehrig*).ti,ab,kw. (39678)
- 4 frontotemporal lobar degeneration/ or exp frontotemporal dementia/ (3988)
- 5 (frontotemporal dementia or FTD or (frontotemporal adj2 degeneration) or FTLD or (Pick* adj2 disease) or frontal variant dementia or bv-FTD or f-FTD or presenile dementia).ti,ab,kw. (12139)
- 6 1 or 2 or 3 or 4 or 5 (52917)
- 7 exp cognition/ or executive function/ (163848)
- 8 cognition disorders/ or Cognitive Dysfunction/ (77334)
- 9 exp Language Disorders/ (47706)
- 10 exp Behavior/ (1749582)
- 11 (cognit* or language disorder* or verbal fluency or verbal memory or executive or behavior* or behaviour*).ti,ab,kw. (1483431)
- 12 7 or 8 or 9 or 10 or 11 (2878231)
- 13 (index or instrument or instruments or questionnaire or questionnaires or scale or scales or screen or test or tests or battery or batteries or inventory or examination or rating form or rating forms or assessment or assessments or checklist or checklists or interview or interviews).ti,ab,kw. (4890750)
- 14 6 and 12 and 13 (3978)
- 15 limit 14 to animals (288)
- 16 limit 15 to humans (148)
- 17 14 not (15 not 16) (3838)
- 18 limit 17 to "all child (0 to 18 years)" (388)
- 19 limit 17 to "all adult (19 plus years)" (2553)
- 20 17 not (18 not 19) (**3674**)
- 21 Validation Studies/ or Psychometrics/ or Feasibility Studies/ or exp "Sensitivity and Specificity"/ or exp reproducibility of results/ (955049)
- 22 predict*.mp. or scor*.tw. or observ*.mp. (5370935)
- 23 21 or 22 (5869434)
- 24 20 and 23 (**1885**)

Search lines 1 to 20 used in the first search of finding instruments in 2017. Validation filter from line 21, used in the second search for finding validated studies in the updated search in 2019

Embase (Ovid) <1974 to 2017 February 09>

- 1 Amyotrophic Lateral Sclerosis/ (31141)
- 2 Motor Neuron Disease/ (9851)
- 3 (amyotrophic or lateral sclerosis* or ALS or motor neuron disease or motor neurone disease or MND or gehrig*).ti,ab,kw. (42845)

- 4 exp frontotemporal dementia/ (14033)
- 5 (frontotemporal dementia or FTD or (frontotemporal adj2 degeneration) or FTL D or (Pick* adj2 disease) or frontal variant dementia or bv-FTD or f-FTD or presenile dementia).ti,ab,kw. (15775)
- 6 1 or 2 or 3 or 4 or 5 (66679)
- 7 exp cognition/ (1979643)
- 8 cognitive defect/ or mild cognitive impairment/ (154984)
- 9 exp Language Disability/ (54813)
- 10 exp Behavior/ (3567062)
- 11 (cognit* or language disorder* or verbal fluency or verbal memory or executive or behavior* or behaviour*).ti,ab,kw. (1453516)
- 12 7 or 8 or 9 or 10 or 11 (5020969)
- 13 (index or instrument or instruments or questionnaire or questionnaires or scale or scales or screen or test or tests or battery or batteries or inventory or examination or rating form or rating forms or assessment or assessments or checklist or checklists or interview or interviews).ti,ab,kw. (5370546)
- 14 6 and 12 and 13 (8361)
- 15 limit 14 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 report or short survey or trade journal) (3529)
- 16 14 not 15 (4832)
- 17 limit 16 to child <unspecified age> (179)
- 18 limit 17 to (adult <18 to 64 years> or aged <65+ years>) (76)
- 19 16 not (17 not 18) (4729)
- 20 limit 19 to animals (165)
- 21 limit 20 to human (0)
- 22 19 not 20 (4564)

*Embase (OVID) <1974 to 2019 December 16>
Search Date 17 Dec. 2019*

- 1 Amyotrophic Lateral Sclerosis/ (36203)
- 2 Motor Neuron Disease/ (9955)
- 3 (amyotrophic or lateral sclerosis* or ALS or motor neuron disease or motor neurone disease or MND or gehrig*).ti,ab,kw. (52987)
- 4 exp frontotemporal dementia/ (16697)
- 5 (frontotemporal dementia or FTD or (frontotemporal adj2 degeneration) or FTL D or (Pick* adj2 disease) or frontal variant dementia or bv-FTD or f-FTD or presenile dementia).ti,ab,kw. (19476)
- 6 1 or 2 or 3 or 4 or 5 (81112)

- 7 exp cognition/ (2156533)
- 8 cognitive defect/ or mild cognitive impairment/ (178702)
- 9 exp Language Disability/ (60350)
- 10 exp Behavior/ (3873970)
- 11 (cognit* or language disorder* or verbal fluency or verbal memory or executive or behavior* or behaviour*).ti,ab,kw. (1789558)
- 12 7 or 8 or 9 or 10 or 11 (5668691)
- 13 (index or instrument or instruments or questionnaire or questionnaires or scale or scales or screen or test or tests or battery or batteries or inventory or examination or rating form or rating forms or assessment or assessments or checklist or checklists or interview or interviews).ti,ab,kw. (6666167)
- 14 6 and 12 and 13 (10402)
- 15 limit 14 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 report or short survey or trade journal) (4740)
- 16 14 not 15 (5662)
- 17 limit 16 to child <unspecified age> (166)
- 18 limit 17 to (adult <18 to 64 years> or aged <65+ years>) (64)
- 19 16 not (17 not 18) (5560)
- 20 limit 19 to animals (237)
- 21 limit 20 to human (0)
- 22 19 not 20 (**5323**)
- 23 validation study/ or psychometry/ or feasibility study/ or "sensitivity and specificity"/ or reproducibility/ (725129)
- 24 predict*.tw. or exp methodology/ or validat*.tw. (7502595)
- 25 23 or 24 (7781725)
- 26 22 and 25 (**2589**)

Search lines 1 to 22 used in the first search of finding instruments in 2017. Validation filter from line 23, used in the second search for finding validated studies in the second search in 2019

Supplementary material 2 Cognitive tests identified in Phase I, classified into cognitive domains, test batteries and scales

Cognitive domain and test	Reference number
<i>Attention, orientation and working memory</i>	
Alternating S-task	1
Alertness task	2-4
Brown-Peterson Technique/ Auditory Constant Trigrams	5-8

Circle discrimination	9,10
Conflict instruction	11,12
Continuous Performance Test	13-17
Corsi Block-tapping Test	4,18-27
Counting test/task of Wilkins	28
D2	29-32
Delayed alternation test	5,7
Digit Span backward	2,4,11,14,15,18-20,22,23,25-27,31,33-107
Digit Span forward	3,12,23,24,27,44,45,65,81,89-91,100,106,108
Five-choice reaction time	9,10
Go-Nogo tasks	2,15,20,58,70,83,108
Incompatibility test	109
Information and orientation	62,110
King-Devick Test	13
Letter-Number Sequencing	16,89-91,111
Letter Span test	112-114
Little Man Test	28
Matching to sample	9,10
Mental Control	104
Money Road-Map Test	28
N-Back Task	2,115,116
Paced Auditory Serial Addition task	11,79,112,114,117
Phonological Similarities effect	118
Reading Span Test	2
Spatial Working Memory	10
Stroop Test/Color- Word Interference Test	3,6,13,15,16,19,21,22,28,29,31,36-41,43,44,48-51,53,57-59,64,66-68,70,74,76,79,82-84,87-91,98-100,102-105,107-109,117,119-142
Symbol substitution test	1,6,28,43,44,53,54,101,102,122,128,129,136,143-145
Telephone search dual task	146
Trail Making tests	1,4,11,12,15,16,22,23,27,33,36,45,47,48,51,53,54,58-60,65-70,72,74-76,84-86,96-99,101,103,104,107,109-111,121,123,125,129,131,132,137-139,141,144,147-155
Visual inspection time test	25
Visual search matching to sample	9,10
<i>Concept formation and reasoning</i>	
Arithmetic	44,45,96,101,117,144
Brixton Spatial Anticipation Test	25,38-41,49,50,64,87,156-163

Card sorting tests	2-5,7,8,16-19,23,27-29,31,32,34,45,46,57,58,69,70,72,74,79,84,85,89-91,93,95-97,99-101,104,110,112-114,119,121,123,125-127,131,132,134,137,141,142,144,146,151,155,160,162,164-179
Category Test	145
Cognitive Estimation task	95
Identities and Oddities task	180
Matrix Reasoning	45,101,103,181
Picture Arrangement	12,96,144
Picture Completion	2,29,62,96,144
Proverbs Test	14,79
Raven's Coloured Progressive Matrices	4,10-12,16-18,20,21,23,24,27,30,32,34,42,46,69,77-80,85,86,93-95,98,100,113,114,118,123,128,131,140,164,167,169,170,177,179,182-191
Reserval learning test	192
Similarities	2,14,29,45,54,58,60,62,70,77,79,96,97,99,101,103,104,108,117,134,141,144,180,193-195
Temporal Rules Induction	20
Visual-Verbal Test	52,72
<i>Construction and motor performance</i>	
Benson Figure (copy)	19,71
Block Design	1,2,5,7,8,15,45,70,74,96,97,101,103,124,131,144,181
Clock drawing test	43,44,194,196
Complex Figure Test (copy)	20,33,54,66,100,137,185,197,198
Cube drawing	196
De Renzi test	18
Finger Tapping Test	62
Grooved Pegboard	59
Kohs Block Design test	79
Memory for sticks and design	108
Object Assembly	45,144
Rosen Drawing Test	180
<i>Executive functioning</i>	
Alternate Uses Test	181
Category fluency tests	1,4,10,15,18-23,27,34-40,42-44,47,49,50,52,55,57,60,64-68,70-72,76,78,82-87,89-92,95-97,99,100,102,104-106,112-114,116,118,121,123,127,129-131,134-137,146,147,151,152,155,158,162,166,173,180,184,185,188,189,194,199-210
Design Fluency tests	2,3,31,71,74,84,104,109,112-114,118,128,143,151,173
Elithorn's Perceptual Maze Test	21
Guilford's Consequences	181
Hayling and Brixton Tests	22,73,111-114,118,146-148,157-160,162,179,199,200

Holiday Apartment Test	192
Iowa Gambling Test	73,159,172
Luria's motor sequences	18
Phonemic fluency tests/Letter fluency tests	2-8,10,14,15,18-20,22-25,27-29,32-36,38-44,47-53,56-60,63-67,71,72,74-78,81-87,89-92,95-97,99,100,102-104,108,109,111-114,116,118,119,121-123,125,127-129,131,134-137,139,143,145-148,150-152,154,155,157-160,162,163,165-167,173,178-180,184,189,190,192,198-200,202,204-208,210-222
Stockings of Cambridge	9,10,192
Tower Tests	16,22,66,67,70,99,100,116,119,135,139,155

Learning and memory

Adult Memory and Information Processing Battery	81,160
Auditory-Verbal Learning Test	3,31,48,101,116
Autobiographical Memory questionnaire	21
Babcock Story Recall test	23,47,223,224
Benton Visual Retention Test	29,45,57,69,180
Brain Injury Rehabilitation Trust Memory and Information Processing Battery	160
Brief Visuospatial Memory Test-Revised	53,60,97,104
California Verbal Learning Test	15,16,36,38,40,49,50,64,66,67,71,74,82-84,87,104,145,146,151,178
Clinical Memory Test	43,44
Complex Figure Test (recall)	14,16-18,20,22,31,34,38,40,45,46,48-50,58,59,64,70,71,75,82,83,85,87,88,96,97,100,101,123,126,129,131,137,138,148,152,167,185,198,201,224
Confabulation questionnaire	21
Continuous recognition memory test	145
Doors and People test	89-91,128,160
Drilled Word Span	108
Evocation test	205
Faces	65,99,101
Hopkins Verbal Learning Test	65,127
Inglis paired associate test	46
Kendrick Object Learning Test	28,80,81,112-114,119,133,159,165,179
Logical Memory	1,25,36,38,40,46,49,50,62,77,87,88,102,103,108,117,129,136,138
Luria-Nebraska Neuropsychological Battery memory test	45
Mini- survey of autobiographical memory	53
Non-verbal Learning Test	170
Prose Memory Test	6

Prospective memory test	130
Recognition Memory Test	5,7,8,28,79,112-114,119,165,176,179,185,225
Recurring Figure test	2,3,29
Rey Auditory- Verbal Learning Test	2,5,7,8,18,20,33,34,36,37,41,42,53,54,57,59,66,67,75,89-91,93,95-97,99,100,103-105,124,129,137,138,144,148,170,198,223,224
Rey's Fifteen-Item Memory Test	69,108,226-228
Rivermead Behavioral Memory Test	89-91,177
Selective Reminding Test	1,22,58,70,180
Serial Digit Learning	15
Verbal learning and memory test	2,29
Verbal Paired Associates	9,28,38,40,49,50,64,66,77,87,110,112-114,119,133,165,188,189
Visual paired associates	9,66
Visual Reproduction	36,62,74,84,102,129,136,138
Williams delayed recall	46
<i>Perception</i>	
Agnosia test	70
Benton Test of Facial Recognition	15,56,136
Benton Judgement of Line Orientation	15,18,19,21,36,53,56,60,65,79,89,91,99,108,112-114,117,145,146,179,185,198
Birmingham Object Recognition Battery	21
Cancellation tests	19-21,25,27,77,80,99,108,180
Cube Counting	37
Dot Counting	37
Efron Shapes Discrimination Test	93
Matching to sample	9
Motor-Free Visual Perception test	5,8,96
Number location	37
Poppelreuter's Overlapping Figures Test	195
Visual Object and Space Perception Battery	22,41,53,112-114,127,131,146,148,157,160,163,176,179,197
<i>Social cognition</i>	
Aprosodia Battery	192
Awareness of Social Inference Test	161,178
Ekman 60 Faces Test	41,159,181,187
Expression Grouping	181
Faux Pas Recognition Test	47,192
Happe Cartoon and Written Scenarios task	127,178
Judgement of Preference Test	39,159,160,163

Missing Cartoons	181
Reading the Mind in the Eyes Test	39,47,88,157-160,178,182,206
Social Intelligence Battery	166
Story-based Empathy task	41
Theory of mind-15	111
Theory of mind -story comprehension	158
<i>Verbal function and language skills</i>	
Aachen Aphasia Test	170,177,184
Arizona Battery of Communication Disorders of Dementia	8,209
Assessment of Pragmatic Abilities and Cognitive Substrates	166
Battery for Analysis of Aphasic Deficits	18-20,41,95,131
Benton Aural and reading comprehension	96
Benton Naming Test	96
Bilingual Aphasia Test	79,117
Borgenhausen Semantic Test	66,67
Boston Diagnostic Aphasia Examination	8,53,59,65,101,146,162,203,209
Boston Naming Test	4,15,21,28,34,36-38,40,48-50,53,55-57,59,60,63-65,69,71,72,74,77,82-92,96,97,99,101,104,108,136,145,151,160,162,173,176,180,207
British Picture Vocabulary Scale	146,162
Chinese Aphasia Battery	43,44
Dysillabic Word Test	85
Graded Difficulty Spelling Test	160,162
Graded Naming Test	25,92,112-114,118,127,146,157-160,163,178,179,190,229
Hodges semantic test battery	185
Kissing and Dancing Test	59,146,162,230
Manchester Picture Naming	127
Mill Hill Vocabulary Scales	46
Moraic Segmentation Test	188
Multiple choice vocabulary tests	3,66,67,109,128,143
North American Adult Reading Test	9,28,56,59,80,89-92,102,104,113,114,118,119,127,129,136,138,145,151,157,159,165,172,176,179,187,190,202,203,229,231,232
Omission of Kana Letters	94
Peabody Picture Vocabulary Test	8,198,207,209
Phonetic Inventory	184
Psycholinguistic Assessment of Language Processing in Aphasia	88,160,229
Pyramids and Palm Trees Test	59,70,72,87,92,99,146,162,230

Reading and Dictation Test	11
Spontaneous writing	24
Spot-the-Word	162
Standard Language Test of Aphasia	94,189
Sydney Language Battery	148,233
Syntax Test of Aphasia	191
Test for the Reception of Grammar	72,92,146,148,160,162,179,185,197,234
Test of adolescent/adult word finding	53
Test of verbal picture naming	58,70
Token Test	16,18,21,32,77,85,96,123,131,140,146,152,166,167,176,185,207
Wechsler Adult Intelligence Scale	2,9,45,62,96,99,101,103,124,144
Wechsler Test of Adult Reading	25,39,40,49,57,87,146,162,178,182,235
Wide Range Achievement Test	36,96,104
Western Aphasia Battery	11,12,136,188
Zingeser and Berndt's Test of Noun and Verb Processing	59
<i>Test batteries</i>	
ALS-Computerized Frontal Battery	56
Behavioural Assessment of the Dysexecutive Syndrome	134
Brief Intelligence Test	23
Communicative Participation Item Bank	236
Comprehensive Affect Testing System	156
Consortium to Establish a Registry for Alzheimer's Disease plus scale	237
Luria-Nebraska Neuropsychological Battery	62,238
Mental Deterioration Battery	226,227
Number Processing and Calculation Battery	86
Wechsler Adult Intelligence Scale	108,110,132,136,138,146,162,168,178,194,239,240
Wechsler Adult Intelligence Scale - Performance IQ	26,29,34,45,61,167,198,241
Wechsler Adult Intelligence Scale - Verbal IQ	26,28,29,34,45,61,96,102,119,126,129,159,198,241,242
Wechsler Memory Scales	123,131
<i>Rating scales, inventories and screening tests</i>	
Addenbrooke's Cognitive Examination	22,73,98,140,147,148,150,153,156,157,161,192,217,221,233-235,243-253
ALS Brief Cognitive Assessment	60
ALS Cognitive Behavioral Screen	37,99,104,206,207,211,214,215,254-257
ALS Frontotemporal Dementia Questionnaire	95,204,208,222
Frontal Behavioral Inventory-ALS	5,32,41,44,59,60,70,72,95,99,152,154,203,208,211,215,222,232,256,258-261

/ Frontal Behavioral Inventory	
Alzheimer's Disease Assessment Scale-Cognitive subscale	78
Blessed Orientation-Memory-Concentration Test	254
Cognitive Abilities Screening Instrument	262,263
Cognitive evaluation battery	205,242,264
Clinical Dementia Rating scale	74,83,92,108,134,155,185,258,265-267
Cortical Visual Screening Test	59
Differential Aptitude Test	89-91
Edinburgh Cognitive and Behavioural ALS Screen	22,30,53,88,160,171,237,268-275
Frontal Assessment Battery	19,20,32,61,70,78,98,122,131,142,152,166,171,189,191,194,207,208,210,212,213,220,222,237,239,244,252,257,259-261,265,270,273,275-284
Hasegawa dementia scale	94,168,186,191,277,285-287
Kana Pick-out Test	168
Kokmen Short Test of Mental Status	198,288
Mini-Mental State Examination	4,6,9,10,14,15,17-24,27,34,35,41,42,44,48,52,54,55,59,61,63,65,69-72,74,77-79,82,83,86,89-92,95,97,99,100,104,105,117,121-124,127,128,130-132,134-137,141-144,152,157,164,168,172,173,180,184-186,189,194,196,204,205,208,210-212,215,219,220,223,229,239,240,242,253,256-260,263,265,275-278,280-283,285,289-311
Milan Overall Dementia Assessment	21
Montreal Cognitive Assessment	32,33,37,53,56,67,75,115,142,171,177,194,206,222,237,239,265,273,279,312-317
Neurobehavioral Cognitive Status Examination	96,202,203
Newcastle Mental Test Score	9
Nuremberg Gerontopsychological Inventory	48
Philadelphia Brief Assessment of Cognition	13
Penn State Brief Exam of Frontal and Temporal Dysfunction Syndromes	181,202,203,318
Rapid Evaluation of Cognitive Function	45,193
Seoul Neuropsychological Screening Battery	83
Three Words-Three Shapes test	108
Telephone Interview for Cognitive Status	215
University of California San Francisco Screening Battery	151,215,218
Verbal Series Attention Test	102-104,129,136,138,145
Weigl's Test	18,21,24,95,127,257,315,319

Abbreviation: ALS, amyotrophic lateral sclerosis; IQ, intelligence quotient.

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