Supplementary Table 1. Participants in the guidelines

SURNAME	FIRST NAME	SOCIETY
Agar	Brugiavini	European Interdisciplinary Council on Ageing
Alonso Ramirez	Javier	European Geriatric Medicine Society
Alves	Mariana	European Geriatric Medicine Society
Bahat	Gülistan	European Geriatric Medicine Society
Barbagallo	Mario	International Association of Gerontology and Geriatrics-European Region
Bauer	Jurgen	European Geriatric Medicine Society
Bautman	Ivan	European Geriatric Medicine Society
Bruyere	Olivier	European Society of Clinical and Economic Aspects of Osteoporosis and Osteoarthritis
Buzaco	Rui	European Geriatric Medicine Society
Casas Herrero	Álvaro	European Geriatric Medicine Society
Cesari	Matteo	European Geriatric Medicine Society
CHEN	Yaohua	European Geriatric Medicine Society
Cherubini	Antonio	European Geriatric Medicine Society
Christodoulou	Nikos	World Psychiatry Association-Preventive Psychiatry section
Corbi	Graziamaria	European Geriatric Medicine Society
Cruz Jentoft	Alfonso	European Geriatric Medicine Society
De Cock	Anne-Marie	European Geriatric Medicine Society
Demurtas	Jacopo	European Geriatric Medicine Society
DOGU	Burcu Balam	European Geriatric Medicine Society
Duraes	Joao	European Academy of Neurology
Freiberger	Ellen	European Geriatric Medicine Society
Fusar-Poli	Paolo	European College of Neuropsychopharmacology
Georges	Jean	Alzheimer Europe
Haaksma	Miriam L.	European Geriatric Medicine Society
Karpenko	Olga	World Psychiatry Association-Preventive Psychiatry section
Kotsani	Marina	European Geriatric Medicine Society

SURNAME	FIRST NAME	SOCIETY
Lamb	Sarah	European Geriatric Medicine Society
Lamloum	Mounir	European Geriatric Medicine Society
Lappas	Andreas	World Psychiatry Association-Preventive Psychiatry section
Limongi	Federica	European Interdisciplinary Council on Ageing
Liuu	Evelyne	European Geriatric Medicine Society
Maggi	Stefania	European Interdisciplinary Council on Ageing
Melis	Rene	European Geriatric Medicine Society
Pinto	Daniel	European Society of Clinical and Economic Aspects of Osteoporosis and Osteoarthritis
Perez Bazan	Laura Monica	European Geriatric Medicine Society
Polidori	Maria Cristina	European Geriatric Medicine Society
Quinn	Terence J	Cochrane Dementia and Cognitive Improvement:
Ramalho	Rodrigo	World Psychiatry Association-Preventive Psychiatry section
Reginster	Jean-Yves	European Society of Clinical and Economic Aspects of Osteoporosis and Osteoarthritis
Ricart	Joan Ars	European Geriatric Medicine Society
Rincon	Almudena Medina	European Geriatric Medicine Society
Rolland	Yves	European Geriatric Medicine Society
Romero-Ortuno	Roman	European Geriatric Medicine Society
Sacco	Guillaume	European Geriatric Medicine Society
Schlögl	Mathias	European Geriatric Medicine Society
Schmidt	Reinhold	European Academy of Neurology
Schoene	Daniel	European Geriatric Medicine Society
Shapiro	Debbie	European Geriatric Medicine Society
Shenkin	Susan	European Geriatric Medicine Society
Sieber	Cornel	European Geriatric Medicine Society
Smith	Lee	European Geriatric Medicine Society
Solmi	Marco	European College of Neuropsychopharmacology
Soysal	Pinar	European Geriatric Medicine Society
Steen Frederiksen	Kristian	European Academy of Neurology
TANNOU	Thomas	European Geriatric Medicine Society

SURNAME	FIRST NAME	SOCIETY
Veronese	Nicola	European Geriatric Medicine Society
YILMAZ	Ozlem	European Geriatric Medicine Society

Supplementary Table 2. Topic 1: Prevention

Component	Description
Review questions	In people without dementia or mild cognitive impairment, are physical activity and/or exercise able to delay the onset of dementia and/or mild cognitive impairment?
Objective	To investigate the effect and the safety of physical activity/exercise in the prevention of dementia and MCI
Population	People without dementia/MCI, defined according to validated criteria, validated scales, (electronic) health records.
Interventions	Physical exercise regimens (in intervention studies); higher physical activity level (in observational studies) as the highest quantile available
Comparisons	Inactive (usual care, standard care, watching list) (in intervention studies); lower physical activity level (in observational studies) as the lowest quantile available
Primary outcomes	Incidence of dementia (defined according to validated criteria [National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association criteria, Diagnostic and Statistical Manual of mental disorders, International Classification of Diseases], validated scales, (electronic) health records)
Secondary outcomes	• MCI and MCI/dementia • Adverse events (total and specific) and safety measures • Drop-out rate • Disability in ADL (activities of daily living)/IADL (instrumental activities of daily living) • Cognitive measures: global and specific domains of cognition, i.e., attention, executive function, memory, motor speed, and language); • Quality of life
Study design	Hierarchical: systematic reviews (with or without meta-analyses) that synthesize randomized controlled trials (RCTs) or controlled clinical trials (CCTs) will be the priority. If not available, singular RCTs/CCTs will be preferred to observational studies (following the order: cohort, nested case-control). If a systematic review-meta-analysis was done before two years from the search, we will update the search with the novel data.
Exclusion criteria	Diagnosis of dementia or MCI made with non-standardized criteria Conference abstracts Cross sectional studies
Planned subgroups analyses	Study design (cohort vs. nested case-control studies) Intervention (RCTs) vs. observational studies

Topic 2: Mild cognitive impairment

Component	Description
Review questions	Are physical activity and exercise able to delay the onset of dementia in people with mild cognitive impairment?
Objective	To verify the effect and the safety of physical activity/exercise in the prevention of dementia in people with MCI
Population	Mild cognitive impairment, defined according to validated criteria [Diagnostic and Statistical Manual of mental disorders, International Classification of Diseases], validated scales, (electronic) health records.
Interventions	Physical exercise regimens (in intervention studies); high physical activity level (in observational studies)
Comparisons	Inactive (usual care, standard care, watching list) (in intervention studies); lower physical activity level (in observational studies)
Primary outcomes	Rate of conversion in dementia (defined according to validated criteria, validated scales, (electronic) health records)
Secondary outcomes	• Adverse events (total and specific) and safety measures • Drop-out rate • Disability in ADL/IADL • Cognitive measures: global and specific domains of cognition, i.e., attention, executive function, memory, motor speed, and language); • Quality of life
Study design	Hierarchical: systematic reviews (with or without meta-analyses) that synthesize randomized controlled trials (RCTs) or controlled clinical trials (CCTs) will be the priority. If not available, singular RCTs/CCTs will be preferred to observational studies (following the order: cohort, nested case-control). If a systematic review-meta-analysis was done before two years from the search, we will update the search with the novel data.
Exclusion criteria	People with dementia. Active controls (e.g., nutritional interventions)
Planned subgroups analyses	Type of physical exercise intervention Type of physical activity Type of MCI (anamnestic, non-anamnestic, others) Study design

Topic 3: Dementia

Component	Description
Review questions	Is physical exercise able to improve cognition and disability in people with dementia?
Objective	To verify the effect and the safety of physical exercise in improving cognition and disability in people with dementia
Population	People with dementia, defined according to validated criteria (defined according to validated criteria [National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association criteria, Diagnostic and Statistical Manual of mental disorders, International Classification of Diseases]), validated scales, (electronic) health records.
Interventions	Physical exercise regimens
Comparisons	Inactive (e.g., usual care, standard care, watching list)
Primary outcomes	Cognitive tests (global and specific domains of cognition, i.e., attention, executive function, memory, motor speed, and language); disability in ADL/IADL
Secondary outcomes	• Adverse events (total and specific) • Drop-out rate • Mortality • Quality of life • Physical performance tests (e.g., gait speed, chair stands time, balance, short physical performance battery, handgrip strength) • Caregivers' burden (Caregiver Burden Inventory) • BPSD • Sleep quality (Pittsburgh Sleep Quality Index)
Study design	Hierarchical: systematic reviews (with or without meta-analyses) that synthesize randomized controlled trials (RCTs) or controlled clinical trials (CCTs) will be the priority. If not available, singular RCTs/CCTs will be used. If a systematic review-meta-analysis was done before two years from the search, we will update the search with the novel data.
Planned subgroups analyses	Type of physical exercise intervention Type of physical activity Type of dementia (any, Alzheimer, vascular dementia, Lewy, fronto-temporal, etc.) Study design
Exclusion criteria	Conference abstracts Active controls (e.g., nutritional interventions) No standardized criteria for dementia

Supplementary Table 3. Criteria evidence for the GRADE of the randomized controlled trials included.

Downgrade	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias
-1	If one or more of the three criteria (randomization, masking, drop-out rate ≤30%) is not met in **10-30%** of trials included in the systematic review	**I^2 50-74%**	The question being addressed by the guideline panel is **different** from the available evidence regarding the PICO or regarding the characteristics of those who will deliver the intervention	(a)The **overall number** of individuals included in trials is low (less than **400 individuals,** both treatment arms) **OR** (b) the 95% confidence interval includes both 1) no effect and 2) appreciable benefit (RR: ≤0.75) or appreciable harm (RR: ≥1.25) [a]	-
-2	If one or more of the three criteria (randomization, masking, drop-out rate≥30%) is not met in **>30%** of trials included in the systematic review	**$I^2 \geq 75\%$**	The question being addressed by the guideline panel is **markedly different** from the available evidence regarding the PICO or regarding the characteristics of those who will deliver the intervention	(a) the **overall number** of individuals included in trials is **very low** (**less than 200 individuals,** both treatment arms) **AND** (b) the 95% confidence interval includes both 1) no effect and 2) appreciable benefit (RR: ≤0.75) or appreciable harm (RR: ≥1.25) [a]	**Egger's test** (p-value) <0.05

[a] For **continuous outcomes** "***no effect***" means a SMD with a confidence interval that ***crosses zero***; **appreciable** benefit or appreciable harm means that the **upper or lower confidence limit crosses an effect size of 0.5** in either direction.

For **dichotomous outcomes** "***no effect***" means an estimate with a confidence interval that ***crosses one***; **appreciable** benefit or appreciable harm means that the upper or lower confidence limit **crosses a risk of 1.25 or 0.75**.

Abbreviations: OR: Odds ratio**; PICO:** Population, Intervention, Comparison and Outcomes; **RR**: Risk Ratio

Supplementary Table 4. Search strategy

1. exp Exercise/
2. Exercise Therapy/
3. Dancing/
4. Dance Therapy/
5. Occupational Therapy/
6. Physical Conditioning, human/
7. Physical Fitness/
8. Exercise Movement Techniques/
9. Physical Endurance/
10. Physical Exertion/
11. Physical Therapy/
12. Resistance Training/
13. Tai Ji/
14. aerobic*.ti,ab.
15. (dance or dancing).ti,ab.
16. ((exercis* adj3 train*) or exercising).ti,ab.
17. (exercis* adj3 prog*).ti,ab.
18. "exercise bike*".ti,ab.
19. (exercis* adj3 cardiovascular).ti,ab.
20. exergam*.ti,ab.
21. "exercise gaming".ti,ab.
22. "exer-gam*".ti,ab.
23. jogging.ti,ab.
24. occupational therapy.ti,ab.
25. "physical activit*".ti,ab.
26. "physical exercis*".ti,ab.
27. "physical endurance".ti,ab.
28. "physical performance".ti,ab.
29. physiotherapy.ti,ab.
30. (resistance adj2 train*).ti,ab.
31. (stretch adj4 (muscle* or exercis*)).ti,ab.
32. swim*.ti,ab.
33. treadmill.ti,ab.
34. walking.ti,ab.
35. yoga.ti,ab.
36. exp Dementia/
37. *Cognition/
38. Cognitive Dysfunction/
39. *Cognition Disorders/
40. Memory Disorders/
41. dement*.ti,ab.
42. alzheimer*.ti,ab.
43. "mental perform*".ti,ab.
44. "preclinical AD".ti,ab.
45. "pre-clinical AD".ti,ab.
46. ((cognit* or memory or cerebr* or mental*) adj3 (declin* or impair* or los* or deteriorat* or degenerat* or complain* or disturb* or disorder* or insufficient* or chronic)).ti,ab.
47. MCI.ti,ab.
48. aMCI.ti,ab.

49. MCIa.ti,ab.
50. (lewy* adj2 bod*).ti,ab.
51. nondemented.ti,ab.
52. non-demented.ti,ab.
53. (cognitively healthy or cognitively normal).ti,ab.
54. Posterior cortical atrophy.ti,ab.
55. binswanger*.ti,ab.
56. Progressive supranuclear palsy.ti,ab.
57. Steele-Richardson-Olszewski syndrome.ti,ab.
58. Huntington*.ti,ab.
59. Frontotemporal disorder*.ti,ab.
60. Frontotemporal degeneration.ti,ab.
61. Corticobasal degeneration.ti,ab.
62. Corticobasal syndrome.ti,ab.
63. or/1-35
64. or/36-62
65. 63 and 64
66. Meta-Analysis as Topic/
67. meta analy*.tw.
68. metaanaly*.tw.
69. Meta-Analysis/
70. (systematic adj (review$1 or overview$1)).tw.
71. exp Review Literature as Topic/
72. or/66-71
73. cochrane.ab.
74. embase.ab.
75. (psychlit or psyclit).ab.
76. (psychinfo or psycinfo).ab.
77. (cinahl or cinhal).ab.
78. science citation index.ab.
79. bids.ab.
80. cancerlit.ab.
81. or/73-80
82. reference list$.ab.
83. bibliograph$.ab.
84. hand-search$.ab.
85. relevant journals.ab.
86. manual search$.ab.
87. or/82-86
88. selection criteria.ab.
89. data extraction.ab.
90. 88 or 89
91. Review/
92. 91 and 90
93. 72 or 81 or 87 or 92
94. 65 and 93
95. randomized controlled trial.pt.
96. controlled clinical trial.pt.
97. randomized.ab.
98. placebo.ab.
99. randomly.ab.

100. trial.ab.
101. groups.ab.
102. or/95-101
103. 65 and 102
104. Epidemiologic studies/
105. exp case control studies/
106. exp cohort studies/
107. Case control.tw.
108. (cohort adj (study or studies)).tw.
109. Cohort analy$.tw.
110. (Follow up adj (study or studies)).tw.
111. (observational adj (study or studies)).tw.
112. Longitudinal.tw.
113. Retrospective.tw.
114. Cross sectional.tw.
115. Cross-sectional studies/
116. or/104-115
117. 65 and 116
118. 94 or 103 or 117

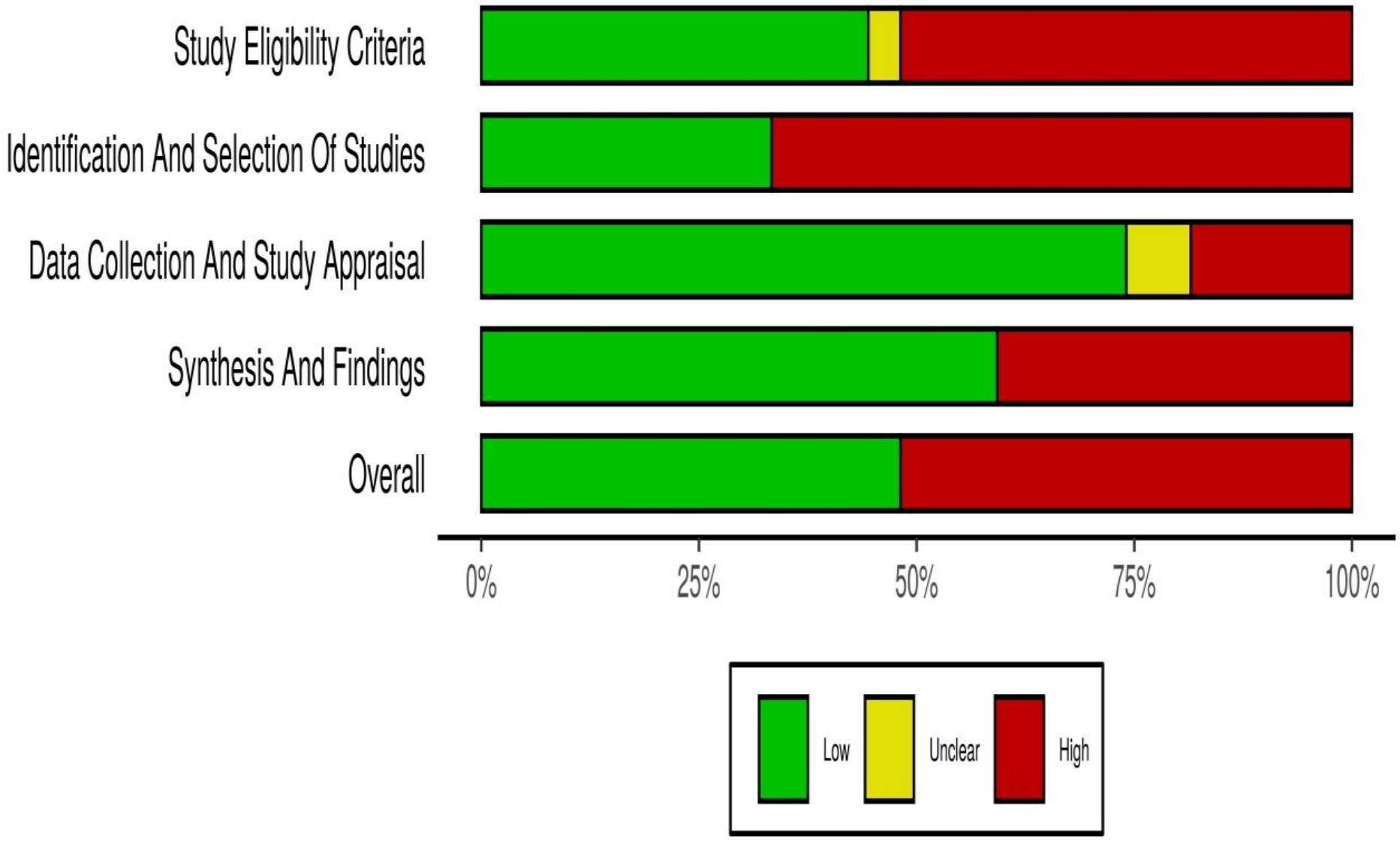
Supplementary Table 5. Plan language summary for patients and caregivers

It is estimated that every three seconds one person in the world will be with dementia. Currently, dementia is not treatable with pharmacological approaches. Therefore, an increasing interest is present for potential modifiable risk factors for this condition, such as physical inactivity. With these guidelines, we try to give some practical indications for the prevention and the treatment of dementia, also in early stages such as mild cognitive impairment (MCI), using physical activity and exercise as intervention.

Overall, our guidelines support the importance of higher physical activity for delaying the onset of dementia in people initially free from this condition. Moreover, in patients already with MCI, exercise may be used for maintaining cognition. Finally, in people already living with dementia, exercise may be used for managing cognition and disability. However, we need more studies for better supporting these statements.

Physical activity/exercise should be recommended also in view of their multiple beneficial effects outside cognition, as recognized by the experts involved in these guidelines. Our guidelines suggest that physical activity/exercise may improve cognitive aspects in dementia and MCI and could be used for the prevention of these conditions often associated with poor quality of life and disability, even if the experts suggest that the integration with pharmacological and non-pharmacological approaches can further increase the efficacy of physical activity/exercise.

Supplementary Figure 1. ROBIS quality assessment of the included systematic reviews


Study Eligibility Criteria
Identification And Selection Of Studies
Data Collection And Study Appraisal
Synthesis And Findings
Overall
0%
25%
50%
75%
100%
Low
Unclear
High