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Screening for Cognitive Impairment in Asymptomatic Community-Dwelling Older Adults: Clinical Utility and Guidelines

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

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Research Questions

1. What is the clinical utility of screening for cognitive impairment in asymptomatic community-dwelling older adults?
2. What are the evidence-based guidelines regarding the use of screening for cognitive impairment in asymptomatic community-dwelling older adults?

Key Findings

One systematic review with meta-analysis and one randomized controlled trial were identified regarding the clinical utility of screening for cognitive impairment in asymptomatic community-dwelling older adults. Six evidence-based guidelines were identified regarding the use of screening for cognitive impairments in asymptomatic community-dwelling older adults.

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including Medline and PsycInfo via OVID, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were cognitive impairment testing in community-dwelling elderly. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2015 and September 29, 2020. A supplemental search was run on September 30, 2020 to capture any articles on the concept of primary care. Internet links are provided where available.

Selection Criteria

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available.

Table 1: Selection Criteria

Population	Community-dwelling adults (age 65 years or older) without symptoms of cognitive impairment
Intervention	Screening for dementia or mild cognitive impairment using a clinician- or self-administered instrument
Comparator	Q1: No screening Q2: Not applicable
Outcomes	Q1: Clinical utility (e.g., health care utilization, health effects of false positive or negative test result, cognitive function, quality of life, depression, anxiety, mortality, harms) Q2: Recommendations regarding the appropriate use of screening for dementia or mild cognitive impairment (e.g., whether to screen, and at what time intervals)
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, evidence-based guidelines

Results

One systematic review with meta-analysis[1] and one randomized controlled trial[2] were identified regarding the clinical utility of screening for cognitive impairment in asymptomatic community-dwelling older adults. Six evidence-based guidelines[3-8] were identified regarding the use of screening for cognitive impairments in asymptomatic community-dwelling older adults. No health technology assessments were identified regarding the clinical utility of screening for cognitive impairment in asymptomatic community-dwelling older adults.

Additional references of potential interest that did not meet the inclusion criteria are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

1. Patnode CD, Perdue LA, Rossom RC, Rushkin MC, Redmond N, Thomas RG, Lin JS. Screening for Cognitive Impairment in Older Adults: An Evidence Update for the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (US); 2020 Feb.
PubMed: PM32129963

OBJECTIVE: We conducted this systematic review to support the U.S. Preventive Services Task Force in updating its 2014 recommendation on screening for cognitive impairment in older adults. **Our review addressed the direct evidence on the benefits and harms of screening for cognitive impairment versus no screening, the test accuracy of screening instruments to detect mild cognitive impairment (MCI) and dementia, and the benefits and harms of treatment for MCI and mild to moderate dementia among community-dwelling older adults age 65 years and older.** DATA SOURCES: **We performed an updated search of MEDLINE, PubMed Publisher-Supplied, PsycINFO, and the Cochrane Central Register of Controlled Trials for studies published through January 2019. We supplemented searches by examining reference lists from related articles and expert recommendations and searched federal and international trial registries for ongoing trials.** STUDY SELECTION: Two researchers reviewed 11,644 titles and abstracts and 966 full-text articles against prespecified inclusion criteria. We included test accuracy studies that included screening instruments that could be delivered in primary care in 10 minutes or less by a clinician or self-administered in 20 minutes or less compared with a reference standard. We included trials of major pharmacologic and nonpharmacologic interventions in persons with MCI or mild to moderate dementia and large, observational studies examining adverse effects of these interventions. We conducted dual, independent critical appraisal of all provisionally included studies and abstracted all important study details and results from all studies rated fair or good quality. Data were abstracted by one reviewer and confirmed by another. DATA ANALYSIS: We synthesized data separately for each key question and within subcategories of screening instruments and treatments. For diagnostic accuracy studies, we focused on sensitivity and specificity of instruments that were evaluated in more than one study. We conducted a qualitative synthesis of results using summary tables and figures to capture key study characteristics, sources of clinical heterogeneity, and overall results of each study. Quantitative synthesis was limited to test performance of the Mini Mental

State Examination (MMSE) (due to insufficient number of homogeneous studies for other instruments) and U.S. Food and Drug Administration (FDA)-approved medications to treat Alzheimer's Disease on global cognitive outcomes, global function, and harms; nonpharmacologic interventions aimed at the patient on global cognitive outcomes; and caregiver and caregiver-patient dyad interventions on caregiver burden and depression outcomes. We ran random-effects meta-analyses using the DerSimonian and Laird method and sensitivity analyses using a Restricted Likelihood Estimation Model with the Knapp-Hartung correction to calculate the pooled differences in mean changes (for continuous data) and pooled risk ratio (for binary data). We used meta-regression to explore potential effect modification by various study, population, and intervention characteristics in cases where 10 or more studies were pooled. We generated funnel plots and conducted tests for small-study effects for all pooled analyses. Using established methods, we assessed the strength of evidence for each question. RESULTS: Screening (Key Questions 1-3)**: Only one trial was identified that examined the direct effect of screening for cognitive impairment on important patient outcomes, including potential harms. In that trial, at 12 months, there was no difference in health-related quality of life between those who were screened vs. not screened. Symptoms of depression and anxiety were also similar between groups at 1, 6, and 12 months as was health care utilization and advance care planning.** We identified 59 studies that addressed the diagnostic accuracy of 49 screening instruments to detect cognitive impairment. Most instruments were only studied in a handful of well-designed diagnostic accuracy studies in primary care-relevant populations. The MMSE, a brief test taking 7 to 10 minutes to complete, remains the most thoroughly studied instrument. The pooled estimate across 15 studies (n=12,796) resulted in 89 percent sensitivity (95% CI, 0.85 to 0.92) and 89 percent specificity (95% CI, 0.85 to 0.93) to detect dementia at a cutoff of 23 or less or 24 or less. Other screening instruments evaluated in more than one study included the very brief instruments (<=5 minutes) of the CDT, MIS, MSQ, Mini-Cog, Lawton IADL, VF, AD8, and FAQ and the brief instruments (6 to 10 minutes) of the 7MS, AMT, MoCA, SLUMS, and TICS with sensitivity to detect dementia usually at 0.75 or higher and specificity at 0.80 or higher for all instruments. For self-administered, longer tests (>10 minutes), only the IQCODE was assessed in more than one study, with sensitivity to detect dementia ranging from 0.80 to 0.88 and specificity ranging from 0.51 to 0.91. Across all instruments, test performance was generally higher in the detection of dementia vs. mild cognitive impairment, although confidence intervals overlapped. **No studies directly addressed the adverse psychological effects of screening or adverse effects from false-positive or false-negative testing**. Treatment (Key Questions 4 and 5): We identified 224 trials and 3 observational studies representing more than 240,000 patients and/or caregivers that addressed the treatment or management of MCI or mild to moderate dementia**. None of the treatment trials were linked with a screening program; in all cases, trial participants were persons with known MCI or dementia**. Pharmacologic Interventions: Based on 45 trials (n=22,431) and three observational studies (n=190,076) that evaluated acetylcholinesterase inhibitors (AChEIs) (i.e., donepezil, galantamine, rivastigmine) and memantine, these medications may improve measures of global cognitive function in the short term, but the magnitude of change is small. In meta-analyses, the differences in changes between those on AChEIs or memantine compared with those on placebo ranged from approximately 1 to 2.5 points on the ADAS-Cog-11 and 0.5 to 1 point on the MMSE over 3 months to 3 years of followup. AChEIs and memantine appeared to increase the likelihood of improving or maintaining patients' global function

by 15 percent (for memantine) to 50 percent (for rivastigmine) in the short term (pooled 95% confidence interval range, 0.49 to 2.69). Other outcome measures were inconsistently reported. Total adverse events and discontinuation due to adverse events were more common with AChEIs, but not memantine, compared with placebo. Rates of serious adverse events overall were not higher among those taking medications vs. placebo, but individual studies noted increased rates of serious adverse events. Trials evaluating other medications or dietary supplements (k=29; n=6,489), including discontinuing antihypertensives, 3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) reductase inhibitors (atorvastatin and simvastatin), nonsteroidal anti-inflammatory drugs (ibuprofen, naproxen, indomethacin, and celecoxib), gonadal steroids (estrogen [plus or minus progesterone] and testosterone), and dietary supplements and vitamins (multivitamins, B vitamins, vitamin E, and omega-3 fatty acids) showed no benefit on global cognitive or physical function in persons with mild to moderate dementia LIMITATIONS: There is a lack of evidence around how screening for and treating MCI and early-stage dementia affects decision making outcomes. Furthermore, there has been little reproducibility in testing specific screening instruments in primary care populations. The treatment literature is limited by a lack of consistency in the specific outcomes reported and short followup duration. It is difficult to interpret the clinical importance of the small average effects seen among treatment trials, and many measures likely have limited responsiveness for patients with less pronounced cognitive impairment. Consistent and standardized reporting of results according to meaningful thresholds of clinical significance would be helpful in interpreting the small average effects on continuous outcome measures. Other important measures such as quality of life, physical function, and institutionalization, were inconsistently reported. CONCLUSIONS: Several brief screening instruments can adequately detect cognitive impairment, especially in populations with a higher prevalence of underlying dementia. **There is no empiric evidence, however, that screening for cognitive impairment or early diagnosis of cognitive impairment improves patient, caregiver, family, or clinician decision making or other important outcomes nor causes harm.** In general, there is support that AChEIs and memantine and interventions that support caregivers, including those that help coordinate care for patients and caregivers, can result in small improvements in the short term. Unfortunately, the average effects of these benefits are quite small and likely not of clinical significance. Any benefits are further limited by the commonly experienced side effects of medications and the limited availability of complex caregiver interventions. Cognitive stimulation and training, exercise interventions, and other medications and supplements showed some favorable effects on patients' cognitive and physical function, but trial evidence lacked consistency and the estimates of benefit were imprecise. There is less evidence related to screening for and treating MCI. The test performance of the few instruments evaluated to detect MCI was lower than the sensitivity and specificity to detect dementia and there is little evidence for any pharmacologic or nonpharmacologic interventions to preserve or improve patient functioning in persons with MCI.

Randomized Controlled Trial

2. Fowler NR, Perkins AJ, Gao S, Sachs GA, Boustani MA. Risks and Benefits of Screening for Dementia in Primary Care: The Indiana University Cognitive Health Outcomes Investigation of the Comparative Effectiveness of Dementia Screening (IU CHOICE)Trial. *J Am Geriatr Soc*. 2020 Mar;68(3):535-543. PubMed: PM31792940

BACKGROUND/OBJECTIVE: The benefits and harms of screening of Alzheimer disease and related dementias (ADRDs) are unknown. **This study addressed the question of whether the benefits outweigh the harms of screening for ADRDs among older adults in primary care**. DESIGN, SETTING, AND PARTICIPANTS**: Single-blinded, two-arm, randomized controlled trial (October 2012-September 2016) in urban, suburban, and rural primary care settings in Indiana.** A total of 4005 primary care patients (aged >=65 years) were randomized to ADRD screening (n = 2008) or control (n = 1997). INTERVENTION: Patients were screened using the Memory Impairment Screen or the Mini-Cog and referred for a voluntary follow-up diagnostic assessment if they screened positive on either or both screening tests. MEASUREMENTS: Primary measures were health-related quality of life (HRQOL; Health Utilities Index) at 12 months, depressive symptoms (Patient Health Questionnaire-9), and anxiety symptoms (Generalized Anxiety Disorder seven-item scale) at 1 month. RESULTS: The mean age was 74.2 years (SD = 6.9 years); 2257 (66%) were female and 2301 (67%) were white. **At 12 months, we were unable to detect differences in HRQOL between the groups (effect size = 0.009 [95% confidence interval {CI} = -0.063 to 0.080]; P = .81). At 1 month, differences in mean depressive symptoms (mean difference = -0.23 [90% CI = -0.42 to -0.039]) and anxiety symptoms (mean difference = -0.087 [90% CI = -0.246 to 0.072]) were within prespecified equivalency range. Scores for depressive and anxiety symptoms were similar between the groups at all time points. No differences in healthcare utilization, advance care planning, and ADRD recognition by physicians were detected at 12 months.** CONCLUSION: We were unable to detect a difference in HRQOL for screening for ADRD among older adults. We found no harm from screening measured by symptoms of depression or anxiety. Missing data, low rates of dementia detection, and high rate of refusal for follow-up diagnostic assessments after a positive screen may explain these findings. J Am Geriatr Soc 68:535-543, 2020.

Guidelines and Recommendations

3. National Institute for Health and Care Excellence. Dementia: assessment, management and support for people living with dementia and their carers. *(NICE guideline NG97)*; 2018 Jun. https://www.nice.org.uk/guidance/ng97/resources/dementia-assessment-management-and-support-for-people-living-with-dementia-and-their-carers-pdf-1837760199109
See: Section 1.2 "Diagnosis" (p. 14-18)

4. Petersen RC, Lopez O, Armstrong MJ, Getchius TSD, et al. Practice guideline update summary: mild cognitive impairment: report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology. *Neurology*. 2018 Jan 16;90(3):126-35. https://pubmed.ncbi.nlm.nih.gov/29282327/
See: Major recommendations

5. Toward Optimized Practice (TOP). Cognitive impairment – part 1: symptoms to diagnosis. *(Clinical practice guideline)*; 2017 Feb. https://actt.albertadoctors.org/CPGs/Lists/CPGDocumentList/Cogn-Imp-1-Symptoms-to-Diagnosis.pdf
See: "Gather Information" (p. 3-4)

6. World Health Organization. Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity; 2017. https://apps.who.int/iris/bitstream/handle/10665/258981/9789241550109-eng.pdf?sequence=1
See: "Considerations for recommendation 5" (p. 14), Box 4 (p. 15)

7. Canadian Task Force on Preventive Health Care, et al. Recommendations on screening for cognitive impairment in older adults. *CMAJ*; 2016 Jan;188(1):37-46. https://www.cmaj.ca/content/cmaj/188/1/37.full.pdf
See: Conclusion

8. Registered Nurses' Association of Ontario. Delirium, Dementia, and Depression in Older Adults: Assessment and Care, Second Edition; 2016. https://rnao.ca/bpg/guidelines/assessment-and-care-older-adults-delirium-dementia-and-depression Full-text: https://rnao.ca/sites/rnao-ca/files/bpg/RNAO_Delirium_Dementia_Depression_Older_Adults_Assessment_and_Care.pdf
See: Summary of recommendations (p. 10)

Appendix — Further Information

Health Technology Assessment – Unclear Methodology

9. Cognitive Impairment Assessment (CIAR) Working Group. Review of Cognitive Impairment Assessment Tools for New Zealand Primary Care; 2020 Apr. https://www.nzdementia.org/Portals/0/LiveArticles/1189/CIAR%20Report%203%20April%202020%20for%20release.pdf?ver=2020-07-20-103120-740
See: Recommendations (p. 5)

Guidelines and Recommendations – Mixed Population

10. BC Guidelines and Advisory Committee. Cognitive Impairment - Recognition, Diagnosis and Management in Primary Care; 2016 Jun. https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/cognitive-impairment
See: Key recommendations

Review Articles

11. Arias F, Wiggins M, Urman RD, et al. Rapid In-Person Cognitive Screening in the Preoperative Setting: Test Considerations and Recommendations from the Society for Perioperative Assessment and Quality Improvement (SPAQI). *Perioper Care Oper Room Manag*. 2020 Jun;19.
PubMed: PM32342018

There are few cognitive screening tools appropriate for fast-paced settings with limited staffing, and particularly in preoperative evaluation clinics. The Society for Perioperative Assessment and Quality Improvement (SPAQI) convened experts in neuropsychology, geriatric medicine, and anesthesiology to conduct a review of the literature and compile a comprehensive list of cognitive screening tools used within primary care and preoperative settings. This Recommendations Statement: 1. summarizes a review of the literature on existing cognitive screening tools used within preoperative settings; 2. discusses factors to consider when selecting cognitive screening tools in a preoperative environment; and 3. includes a work flow diagram to guide use of these screening measures. Methodology involved searching peer-reviewed literature for 29 cognitive screening tools which were identified from the literature that fit inclusion criteria. Of these 29, seven tests have been used in preoperative settings and are discussed. These seven had an average administration time ranging from one to ten minutes. Memory, language, and attention were the most commonly evaluated cognitive domains. Most had adequate sensitivity and specificity to detect cognitive impairment/dementia. While information on the psychometric properties of these tools is limited, the tools discussed are appropriate for lay examiners, are short in duration, and accessible for free or at a low cost. We describe factors that must be considered prior to instrument selection.

12. Scott J, Mayo AM. Instruments for detection and screening of cognitive impairment for older adults in primary care settings: A review. *Geriatr Nurs*. 2018 May - Jun;39(3):323-329.
PubMed: PM29268944

The Patient Protection and Affordable Care Act requires evaluation for cognitive

impairment as part of the Annual Wellness Visit (AWV). Nurses and nurse practitioners in primary care are in a good position to incorporate brief cognitive screens into the AWV. Early recognition of cognitive problems allows clinicians and patients the opportunity to discuss any new or ongoing concerns about cognition, address possible reversible causes, or refer for further evaluation. It should be noted that some patients may prefer not to explore for cognitive impairment. Numerous brief cognitive screens have been developed for primary care, with no one screen being appropriate for all patients or clinicians. This review examines the psychometric properties, usefulness, and limitations of both patient and informant brief (under five minutes) cognitive screens endorsed by the Alzheimer's, National Institute of Aging (NIA), and Gerontological Society (GSA) workgroups, plus a recently developed brief version of the standard MoCA.

Additional References

13. Recognising and managing early dementia. *Best Practice Journal*. 2020 Feb. https://bpac.org.nz/2020/docs/dementia.pdf
See: Cognitive screening and assessment (p. 5)

14. Hantke NC, Gould C. Examining older adult cognitive status in the time of COVID-19. *J Am Geriatr Soc*. 2020 2020;68(7):1387-1389.
PubMed: PM32343394

    The rapid onset of the coronavirus disease 2019 (COVID-19) pandemic has left many providers ill equipped to continue to provide care as usual. As older adults are particularly at risk for mortality with COVID-19, most providers have rightly pivoted to clinical care via telephone and virtual video visits. Recent research suggests older adults are open to the idea of virtual visits, often preferring them as compared to face-to-face appointments for specialty mental health and dementia care. However, not all clinical services are easily translated into a virtual environment, resulting in providers either utilizing creativity or foregoing clinical tools during the health crisis. This letter briefly reviews the current state of remote cognitive assessment, with the goal of outlining appropriate clinical measures for older adults. (PsycInfo Database Record (c) 2020 APA, all rights reserved)

15. Ismail Z, Mortby ME. Cognitive and Neuropsychiatric Screening Tests in Older Adults. In: Chiu H., Shulman K., eds. Mental Health and Illness of the Elderly. Singapore: Springer. 2017.
https://doi.org/10.1007/978-981-10-2414-6_16

    A number of instruments are available to clinicians to assess cognitive and neuropsychiatric features of neurocognitive disorders in older adults, from preclinical and prodromal stages through to more severe stages of dementia. This chapter provides a comprehensive overview and discussion of the key characteristics to consider when selecting a screening instrument to support accurate and timely assessment of cognitive changes and neuropsychiatric symptoms, both of which are core features of neurocognitive disorders. Particular consideration must be given to factors such as the assessment setting (e.g., acute care versus residential care environment), the population for which a measure was developed, and the context in which the instrument was validated. When selecting an instrument, clinicians must also consider possible population-based bias effects as a result of use in culturally and

linguistically diverse populations or due to differences in educational attainment. Improving understanding of the diversity in measures available to assist clinicians in differing care contexts is fundamental so that the best possible care and treatment plans can be implemented, and better support provided to next of kin and caregivers (both formal and informal caregivers). (PsycINFO Database Record (c) 2019 APA, all rights reserved)