American Academy of Nurse Practitioners

PRACTICE

An evaluation of dementia screening in the primary care setting

Jennifer R. Harvan, RN (Student, MSN Adult Health Nurse Practitioner Program) **&**
Valerie T. Cotter, MSN, CRNP, FAANP (Program Director, Adult Health & Gerontology, Nurse Practitioner Programs)

School of Nursing, University of Pennsylvania, Philadelphia, PA

Keywords
Dementia; cognitive impairment; screening; primary care; outpatient.

Correspondence
Jennifer R. Harvan, BS, 374 Shurs Lane #101, Philadelphia, PA 19128. Tel: 215 483 4693; E-mail: jharvan@nursing.upenn.edu

Received: July 2005; accepted: February 2006

doi:10.1111/j.1745-7599.2006.00137.x

Abstract

Purpose: To evaluate current screening methods for dementia to determine the most accurate and efficient tools for use in primary care.

Data sources: Search included the following: Medline, CINAHL, BIOSIS, PsycINFO, ISI Web of Science, and Health & Psychosocial Instruments (1840–2005). The following search terms were used: screen, screening, tools, Mini Mental, MMSE, clock drawing, subjective memory, assessment, diagnosis, primary care, outpatient, community based, ambulatory care, dementia, cognitive impairment, and memory impairment. There was no limit to publication year. Articles excluded were those not published in English and those which used screening tools as part of diagnostic evaluation. The search revealed 581 relevant articles, which were narrowed to 20.

Conclusions: The Mini Mental State Examination (MMSE) has high sensitivity and specificity in outpatients older than 65 years when age- and education-specific cutoffs are used. The clock drawing test has lower sensitivity and specificity when used alone; however, in combination with the MMSE, its sensitivity is higher than that of the MMSE while specificity is slightly lower. Subjective memory complaints contribute diagnostic information; however, objective memory performance is a stronger predictor of future dementia. All measures are subject to influence by age, education, and other physical factors. The body of evidence regarding dementia screening methods has increased in recent years. The studies have been well conducted, of large sample size, in various geographic locations and populations, and by numerous investigators.

Implications for practice: Dementing illnesses will become a common presentation in primary care. Currently, routine screening is not conducted although acceptable instruments, such as the MMSE, are available. Additional research on routine screening in primary care to bolster the current evidence, use of nurses as evaluators of cognition, and utilization of specialists is needed.

Introduction

In 2000, there were 4.5 million persons with Alzheimer's disease (AD) in the United States (Hebert, Scherr, Bienias, Bennett, & Evans, 2003). According to Hebert et al. (2003) projections based on the 2000 census predict that this number will increase by almost threefold, to 13.2 million, by the year 2050. This estimate agrees with that of Evans (1990), who hypothesized that 7.5–14.3 million persons 65 years and older will have AD in 2050. The greatest known risk factor for developing dementia and AD is increasing age (Alzheimer's Disease and Related Disorders Association, 2004). Because of the rapid growth of the oldest age groups of the U.S. population, the number of persons who are 85 years and older will more than quadruple, to 8.0 million by the year 2050 (Hebert et al.). The number of persons who are 75–84 years old will double to 4.8 million, while the number who are 65–74 years old will remain fairly constant at 0.3–0.5 million (Hebert et al.).

Based on the above projections, cognitive impairment and dementing illness such as AD will become a common presentation in primary care practice in the years ahead. Therefore, routine screening of persons older than 65 years

for dementia will become even more essential to properly care for our aging population. However, currently most older patients with cognitive impairment are not identified in primary care practices (Finkel, 2003).

Identification of persons with dementia in the primary care setting has been problematic. In a study by Valcour, Masaki, Curb, and Blanchette (2000), 26 cases of dementia were found in 297 outpatients; 17 (65%) of the dementia cases were not documented in the medical record. When dementia was mild, over 90% of the cases were overlooked, while no cases of severe dementia were missed. Predictors of documentation in the medical chart included behavioral symptoms or more dependence in activities of daily living (Valcour et al., 2000). An additional study by Boise, Neal, and Kaye (2004) found that only 18% of 164 patients identified as mildly cognitively impaired and 34.8% of 76 patients identified as moderately to severely cognitively impaired had evidence in their medical chart of having been clinically evaluated for dementia. Interestingly, the majority of cognitively impaired patients had experienced one or more medication-use errors, problems in compliance with treatment recommendations, falls, emergency room visits, family contacts with the doctor related to concerns about the patient's memory or functioning, symptoms of cognitive deficits (i.e., memory problems, ''poor historian'' or ''confusion''), and inappropriate patient contacts (i.e., presenting at the wrong time or day for an appointment, frequent phone calls to the doctor's office) (Boise et al., 2004). These issues should have resulted in further cognitive evaluation by the provider.

A barrier to assessing and diagnosing cognitive impairment in primary care practice is that patients with a mild form of cognitive impairment often present as "socially appropriate, friendly, and cooperative" as well as able to answer questions and follow instructions (Finkel, 2003; Solomon et al., 2000). In addition, providers must utilize their limited time with patients to address more physiological medical conditions such as diabetes, hypertension, and arthritis, and often do not have time to conduct a mental status evaluation that generally takes longer. Most alarmingly, many physicians report that they are not exactly sure how to diagnose, manage, or treat dementing illnesses (Finkel).

There are documented benefits of early detection of dementia, such as starting patients on anticholinesterase medications and addressing issues related to financial matters, self-care, living situation, and assistance with instrumental activities of daily living (Finkel, 2003; Solomon et al., 2000). Numerous screening methods to detect cognitive changes are available; however, they are not consistently or routinely utilized as part of a medical evaluation in primary care. An evaluation of current screening methods for dementia was performed in order to determine the most accurate and efficient evaluation tools that could be applied to the primary care setting. Based on the findings, clinical implications and recommendations for practice change have been suggested.

Methods

The search of the literature included MEDLINE (1966 to February 2005), CINAHL (1982 to February 2005), BIOSIS (1993–2004), PsycINFO (1840 to February 2005), ISI Web of Science (1945 to February 2005), and Health & Psychosocial Instruments (1985–2004). The following terms were used in both keyword and title searches: screen, screening, tools, Mini Mental, MMSE, clock drawing, subjective memory, assessment, diagnosis, primary care, outpatient, community based, ambulatory care, dementia, cognitive impairment, and memory impairment. The search was not limited to publication year in order to encompass all relevant research findings in this area. Articles that were not primary research articles or published in English were excluded. Literature using cognitive screening tools as part of a diagnostic battery rather than as a screening tool was excluded as the reliability and validity of the individual instruments could not be determined. The search of Health & Psychosocial Instruments did not reveal any usable articles. An Internet search using Google as the search engine was also performed utilizing the same search terms. Although no additional primary research articles were obtained from this search, it did provide an article in which a manual search of the cited articles revealed relevant primary research not previously identified. A manual search of the references gleaned from the initial search revealed additional relevant articles. The literature search revealed a total of 581 relevant articles; 20 articles were used in the final analysis of dementia screening methods. The screening tools in this review were evaluated based on the ease and efficiency of administration, sensitivity, specificity, reliability, and validity (see Table 1).

In the articles reviewed, the diagnosis of dementia was based on either the Diagnostic and Statistical Manual of Mental Disorders (DSM), Versions III through IV, or the National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer's Disease and Related Disorders Association (NINCDS-ADRDA) criteria. According to the DSM-IV manual (American Psychiatric Association, 1994), a dementia diagnosis is established by the development of multiple cognitive deficits manifested by both memory impairment and one or more cognitive disturbances such as aphasia, apraxia, agnosia, or disturbance in executive functioning. The cognitive deficits, characterized by gradual onset, cause impairment in social or occupational functioning and represent significant decline from previous level of function. Last, these deficits

Table 1 Dementia screening tools for primary care use

Screening tool	Method of administration	Average time of administration	Scoring	Sensitivity (%)	Specificity (%)	Reliability	Validity	Advantages	Disadvantages
Mini Mental State Exam (MMSE)	Verbal and written	5–12 min	11 items in five domains; score: 0–30; standard cutoff score for dementia: 23–24	86–92	92–99	Test–retest 0.887, internal consistency 0.86, interobserver 0.97	Content, predictive, construct with Wechsler 0.66–0.776	Strong predictor of dementia	Varying accuracy in patients of different ages, education levels, and ethnicities; cut points vary
Modified Mini Mental State Exam (3MS or mMMSE)	Verbal and written	12–15 min	15 items	87	89	Internal consistency 0.87–0.91, interrater 0.98, test–retest 0.78	Construct with MMSE 0.95	Marginally superior to MMSE in discriminating between severity of dementia and normals	May be susceptible to influences of age and education; too lengthy for primary care use
Clock Drawing Test (CDT)	Verbal	1–4 min	Varies: Manos (10 pt), Mendez (20 pt), Sunderland (10 pt), Rouleau (10 pt), Pfizer (4 pt), and AD Cooperative Study (5 pt)	59–74.7	65.5–90	Test–retest 0.87–0.94, interrater 0.82–0.97	Construct with MMSE 0.73, construct with CAMCOG 0.80	Very short administration time; no equipment needed	May be affected by impairment in physical abilities (vision, handwriting)
General Practitioner Assessment of Cognition (GPCOG)	Verbal	4–5 min (patient <4 min, informant <2 min)	Patient maximum score = 9 on four items and informant maximum score = 6 on six items	82–85	83–86	Patient: interrater 0.75, test–retest 0.87, internal consistency 0.84; informant: interrater 0.56, test–retest 0.84, internal consistency 0.80	Construct with MMSE 0.683	Patient and informant data collected	Lack of informant at primary care visits
7 Minute Screen (7MS)	Verbal	7 min	Four tests	89.4–92.9	93.5	Test–retest 0.87–0.91	Construct	Better to detect mild dementia than MMSE	May be too lengthy for primary care use
Memory Impairment Screen (MIS)	Verbal	4 min	Four items	80–86	96–97	Internal consistency 0.67	Construct with three-word memory test	Avoids effects of education (reading and writing)	
Mini-Cog	Verbal	2–4 min	Three-item recall + CDT; 1 pt per recalled word; 0 = positive screen for dementia; 1–2 with abnormal CDT = positive; 1–2 with normal CDT = negative; 3 = negative	76–99	89–96	Interrater 0.93–0.95	Construct with MMSE	Not influenced by language or education; no special equipment needed	

pt = point.

must not be caused by other central nervous system or systemic conditions known to cause dementia (American Psychiatric Association). The NINCDS-ADRDA criteria are similar in that progressive deterioration of specific cognitive functions such as aphasia, apraxia, and perceptions must be present in addition to impairment in activities of daily living and altered patterns of behavior (McKhann et al., 1984).

Evaluation of screening tools

Subjective memory complaints

Elderly patients who present to their primary care provider with subjective memory complaints should be evaluated for cognitive decline although only a small percentage will actually have objective memory performance problems. In the studies reviewed, subjective memory complaints were often assessed by asking the patient, "do you have problems with your memory?" and requesting a "yes" or "no" answer from the patient. The majority of the research agrees that subjective memory complaints in nondemented, community-based elders contribute a small but significant amount of diagnostic information; however, objective memory performance is a stronger predictor of future dementia (Schmand, Jonker, Hooijer, & Lindeboom, 1996; Schofield, Marder, Dooneief, Jacobs, Sano, & Stern, 1997; St. John & Montgomery, 2002; Wang et al., 2004).

On the contrary, findings of Jungwirth et al. (2004) in a nondemented sample in Vienna, Austria, found no difference in the actual memory performance between those who complained of memory problems and those who did. Interestingly, only 6.3% of memory-impaired subjects actually complained about their proven memory impairment, which translates to 94% of memory-impaired subjects who did not complain of memory problems (Jungwirth et al., 2004). Subjective memory complaints have been linked to lower level of education, higher depression scores, older age, male gender, and poorer overall health (Schmand et al., 1996; Schofield et al., 1997; St. John & Montgomery, 2002; Wang et al., 2004).

In a study of patients diagnosed with mild cognitive impairment (MCI) and a group of matched controls, self-reported deficits in activities of daily living were higher in patients with MCI versus the healthy controls (Tabert et al., 2002). Furthermore, self- and informant-reported functional deficits were significantly greater for patients who converted to AD. According to Tabert et al. (2004), converters to AD showed significantly more informant- than self-reported deficits at baseline, while nonconverters showed more self-reported deficits.

While a diagnosis of dementia should never be assumed in a patient with subjective memory complaints, a further work-up with an established screening tool should be warranted. A diagnosis of depression should also be suspected, as subjective memory complaints tend to increase with depressive symptoms. Additional study of subjective memory complaints needs to be done in the primary care setting. It would be interesting to see if these complaints were documented in the patient's medical chart, whether there was evidence of follow-up by the provider and the outcome of that follow-up if available.

Mini Mental State Examination

The Mini Mental State Examination (MMSE) is one of the oldest and most widely utilized cognitive measures as well as the most common tool against which other cognitive measures are compared. The MMSE was developed in 1975 and includes five cognitive domains: orientation, registration, attention and calculation, recall, and language. It has been utilized in both clinical practice and research protocols. The literature is in agreement that the MMSE score is a strong predictor of dementia (Braekhus, Laake, & Engdal, 1995; Folstein, Folstein, & McHugh, 1975; Tangalos et al., 1996). The MMSE has high test–retest reliability (Pearson coefficient $r = 0.887$), internal consistency of 0.86, and high interobserver reliability (mean kappa value 0.97) (Folstein et al., 1975; McDowell, Kristjansson, Hill, & Hebert, 1997; O'Connor et al., 1989). O'Connor et al. (1989) established a sensitivity of 86% and specificity of 92% when standard cutoff points of 23–24 out of 30 were used with the MMSE in a survey of general practice patients.

There are some limitations with the clinical utility of the MMSE. Past use of the MMSE has indicated that there are significant associations between MMSE score and age (especially those aged 85 years and older) and less education (Bassuk & Murphy, 2003; Braekhus et al., 1995; Jagger, Clarke, Anderson, & Battock, 1992; Tangalos et al., 1996). There has also been speculation that social class, male gender, and visual impairment contribute to a lower score, which may not be indicative of cognitive decline (Bassuk & Murphy; Jagger et al., 1997). A study conducted by Tangalos et al. (1996) in an internal medicine practice found that using age- and education-specific cutoff scores increased the sensitivity of the MMSE to 92% and the specificity to 99%.

The modified MMSE (3MS or mMMSE) includes four additional items: date and place of birth, animal naming, similarities, and a second delayed recall task. The modified version was developed to improve the MMSE performance in screening for dementia. The scale's internal consistency ranges from 0.87 to 0.91, interrater reliability is 0.98, and test–retest reliability over 3 years is 0.78 (Bassuk & Murphy, 2003; McDowell et al., 1997). The 3MS has

a sensitivity of 87% and specificity of 89%, less than that of its short version, the MMSE; however, the 3MS is marginally superior to the MMSE in discriminating between severities of dementia and normal patients (McDowell et al.). The correlation between the MMSE and 3MS is significant (0.95) and is therefore susceptible to the same influences of age and education bias.

The documentation of MMSE use is limited in the primary care setting; therefore, its utility is largely unknown. The study conducted by Tangalos et al. (1996) examined the use of the MMSE as part of the general medical exam. Physicians felt that the MMSE provided little value for routine screening; however, they would use the tool in selected populations where cognitive decline is suspected as part of clinical testing. However, O'Connor et al. (1989) tested its utility in general practice settings and found the MMSE of value. Because of the MMSE's accuracy in research samples of similar characteristics, that is, age, education, ethnicity, and outpatient status, its use in primary care should be further explored. Although this tool takes approximately 5 min to administer, the time spent will be greatly important to following a patient's cognitive status over time.

Clock Drawing Test

The Clock Drawing Test (CDT) was developed by Sunderland et al. (1989) as a test to distinguish samples of patients with AD from elderly controls. The CDT entails asking the patient to "put the numbers in the face of a clock" and the "make the clock say ten minutes after eleven" (Manos & Wu, 1994). As dementia severity increases, clock drawing performance decreases (Powlishta et al., 2003). The test–retest reliability of CDT ranges from 0.87 to 0.94 and interrater reliability ranges from 0.82 to 0.97, depending on the scoring method utilized (Manos & Wu; Seigerschmidt, Mosch, Siemen, Forstl, & Bickel, 2002). In a study by Seigerschmidt et al., scoring judgments using the Manos and Shulman versions were the most consistent among raters, while use of the Wolf-Klein and Shulman versions resulted in the most inconsistent judgments. Using the Cahn criteria with a cutoff score of 7, the CDT has a reported sensitivity of 74.7% and specificity of 75.6% (Yamamoto et al., 2004). The CDT can distinguish between normal aging and mild dementia; however, sensitivity for very mild dementia is poor (Powlishta et al., 2003).

Utilizing the Manos and Wu 10-point scoring method in which cognitive impairment is suspected as scores decrease, Seigerschmidt et al. (2002) found that CDT scores decrease with increased age, female gender (opposite effect seen with the MMSE), and less than 9 years of education. In contrast, Yamamoto et al. (2004) reported that clock drawing test scores did not correlate significantly with age, years of education, or score on the Geriatric Depression Scale. When Seigerschmidt et al. controlled for age, gender, and education in their analysis of CDT scores, there was a significant difference between the scores of the cognitively unimpaired patients and cognitively impaired patients. The sensitivity and specificity were 66.7% and 65.5%, respectively. The positive predictive value (PPV) of the CDT is approximately 60% and the negative predictive value (NPV) was about 75% (Seigerschmidt et al.). It should be noted that impairment in physical abilities such as arthritis or visual impairment should be taken into account when evaluating poor clock drawing performance (Huntiziner, Rosse, Schwartz, Ross, & Deutsch, 1992).

Heinik, Solomesh, Bleich, and Berkman (2003) compared the use of the CDT combined with the MMSE to a more lengthy and detailed Cambridge Cognitive Examination (CAMCOG) to evaluate dementia in a specialized psychogeriatric outpatient setting. The CDT was highly correlated with the MMSE (0.73) and CAMCOG (0.80). The correlation between CDT and MMSE is confirmed by the work of Sunderland et al. (1989) in AD patients and normal controls, and by Yamamoto et al. (2004) in an outpatient population with memory complaints. Combining the CDT and MMSE produced a sensitivity of 100% and a specificity of 91%, equivalent to that of the CAMCOG and much higher than the individual instruments used alone (Heinik et al., 2003). The CDT and MMSE used together have a high discriminative ability (0.98) and had a higher discriminative ability than the instruments separately for very mild degrees of cognitive impairment (0.94).

While the CDT alone does not have the sensitivity and specificity of the MMSE, its use in combination with the MMSE has the highest predictability, especially in very mild stages of cognitive decline. This finding is extremely applicable in the primary care setting where most patients being seen are in the earlier stage of decline. The CDT takes a patient approximately 1 min to complete which is also an asset in a busy primary care practice. Combined with the MMSE, these tools would only consume about 6 min of valuable time of healthcare provider and provide an accurate picture of whether more extensive cognitive testing should be ordered.

General Practitioner Assessment of Cognition

A recently developed screening method for general practitioners, the General Practitioner Assessment of Cognition (GPCOG), has good reliability and shows promise to be comparable to the Mini Mental in detecting dementia in the primary care setting. The two-stage method of administering the GPCOG had a sensitivity of 85%, specificity of 86%, misclassification rate of 14%, and a PPV of 71.4%

(Brodaty et al., 2002). Patient interviews took less than 4 min and the informant interviews took less than 2 min to complete. A major concern with this instrument is the lack of an informant present at primary care visits. This problem could be allayed by contacting an informant via telephone following the visit. More testing of the utility of the GPCOG in primary care settings is needed prior to suggesting its use as a screening method.

7 Minute Screen

Another recently developed screening tool, the 7 Minute Screen (7MS), has been tested in both primary care settings and outpatient geriatric or memory clinics. The 7MS consists of four tests: orientation, memory, visuospatial functioning, and expressive language. In a study by Solomon et al. (2000) in the primary care setting, the 7MS had a PPV of 91%, a NPV of 96%, and an overall test–retest of $r = .91$ for positive screens and $r = .87$ for negative screens.

Similarly, in a study by Meulen et al. (2004), in patients with varying types of dementia or depression recruited from a geriatric day clinic and memory clinics plus a small normal control group, the 7MS had a sensitivity of 92.9% and a specificity of 93.5% for AD, and a sensitivity and specificity of 89.4% and 93.5%, respectively, for other dementias. The PPV was 98%, higher than that of the previous study; however, the NPV was 75%, much lower. The 7MS was significantly better than the MMSE in differentiating the individuals with dementias from those who were cognitively intact. As with the GPCOG, additional testing of the utility of the 7MS among a larger number of subjects from various primary care providers is needed prior to suggesting its use as a general screening method.

Memory Impairment Screen

An additional screening tool, the Memory Impairment Screen (MIS), is a brief, four-item, delayed free- and cued-recall memory impairment test. In a sample of community-residing subjects over the age of 50, the MIS had a discriminative value of 94% for dementia and 97% for AD; using a cut-score of 4, the MIS had a sensitivity of 80%, a specificity of 96%, and a PPV of greater than 69% (Buschke et al., 1999). In a population of older community-dwelling adults, the MIS had a sensitivity of 86%, a specificity of 97%, and a greater PPV of 80% as a screen for AD (Kuslansky, Buschke, Katz, Sliwinski, & Lipton, 2002). Short tests of recall such as the MIS may avoid the effects of education on test scores because education is unlikely to affect short-term memory (Molloy, 2003). Molloy believes that the MIS may be superior to the MMSE in that it does not require reading or writing, which limits the utility of the MMSE, and it takes only 4 min to administer, shorter than the MMSE, which can take up to 20 min to administer depending on the patient.

Mini-Cog

The Mini-Cog, a combination of a three-item recall and the CDT, was developed as a brief test for discriminating demented from nondemented persons (Borson, Scanlan, Brush, Vitaliano, & Dokmak, 2000). In studies of general elderly population, the Mini-Cog had a sensitivity of 76%–99% and a specificity of 89%–96% (Borson et al., 2000; Scanlan & Borson, 2001). This instrument is not influenced by education or language (Borson et al.). Based on information from the general population, it seems plausible that this tool would be useful in identifying demented patients in primary care.

Other screening methods include the 6 Item Cognitive Impairment Test (6CIT), the Time and Change (T&C) test, and the Brief Cognitive Scale (BCS). The evidence of the effectiveness of these screening tools as well as their use in practice is limited. According to a review of screening tools by Lorentz, Scanlan, and Borson (2002), the three tests that showed the most promise for broad application in primary care settings are the Mini-Cog, the MIS, and the GPCOG. However, formal practice intervention trials are needed to validate the utility of these short screens with regard to implementation, effect on rates of diagnosis and treatment of dementia patients, and outcomes for patients, families, and healthcare systems (Lorentz et al., 2002).

Discussion

Practice implications

Currently, providers in primary care settings are not routinely screening for dementia in their elder population over the age of 65 years. The current recent recommendations by major committees and associations such as the U.S. Preventive Services Task Force (USPSTF), the Canadian Task Force on Preventive Health Care (CTFPHC), and the American Academy of Neurology state that there is insufficient evidence to recommend for or against routine screening for dementia in older adults (Patterson & Gass, 2001; Petersen et al., 2001; USPSTF, 2003). According to the USPSTF, "a screening test must satisfy two major requirements to be considered effective: the test must be able to detect the target condition earlier than without screening and with sufficient accuracy to avoid producing large numbers of false-positive and false-negative results plus screening for and treating persons with early disease should improve the likelihood of favorable health outcomes compared to treating patients when they

present with signs or symptoms of the disease" (USPSTF, 1996, p. xlii).

The USPSTF concluded that current screening tests have good sensitivity but only fair specificity in detecting cognitive impairment and dementia and does not recommend for or against routine screening (USPSTF, 2003). Based on the review of relevant articles on the MMSE, this tool's sensitivity as well as specificity is high enough to recommend its use for routine screening. In the study by O'Connor et al. (1989), using the standard cut points, the MMSE's specificity was 92%, and in research by Tangalos et al. (1996), the specificity was even higher, reaching 99%, when age- and education-specific cut points were utilized. Use of the MMSE in conjunction with the CDT increased the specificity of the CDT from approximately 65%–75% when used alone to 91% when combined with the MMSE (Heinik et al., 2003).

The USPSTF (2003) suggests "clinicians should assess cognitive function whenever cognitive impairment or deterioration is suspected, based on direct observation, patient report, or concerns raised by family members, friends or caretakers." However, this does not seem to be the norm in primary care settings. As noted earlier, Valcour et al. (2000) found that 65% of dementia cases in a primary care setting were not documented in the medical record. More importantly, when dementia was mild, which is often the case in patients seen by the primary provider, 90.9% of the cases were overlooked. Predictors of documentation of the presence of cognitive impairment include behavioral symptoms or increased dependence in activities of daily living, but the patient or an informant may not report these unless prompted by the provider (Valcour et al.).

An additional problem with relying on providers' judgment to determine when to screen patients is that patients can successfully hide symptoms of memory loss for a substantial time (Geldmacher, 2002). Also, it has been found that family members who recognize memory problems are likely to attribute the changes to normal aging (Geldmacher). Finally, according to Geldmacher, family members are often not present during examination in primary care practices; therefore, the patient with the memory problem becomes the primary source of information.

The USPSTF, the CTFPHC, and the American Academy of Neurology are also not convinced of the efficacy of current drug therapies, such as cholinesterase inhibitors, on preserving or improving cognitive function, that is, delaying natural progression of AD. Although the effectiveness of current medications is important in addressing the physiological aspects of dementia, often of more importance to the patients and their loved ones is the improvement or maintenance of quality of life. Early identification allows a patient and his/her family ample time to prepare for what lies ahead with a diagnosis of dementia. A person with AD will live between 3 and 20 years, with an average of 8 years, from the onset of symptoms (Alzheimer's Disease and Related Disorders Association, 2004). If patients are identified in the earlier stages of cognitive decline, they will be better able to participate in discussions regarding financial planning, preferences in end-of-life care, and future living arrangements (Clark, 1999; Cotter, 2002). Finkel (2003) suggests that these patients may need additional support in the short term or long term with medication compliance, nutritional services, housekeeping to maintain cleanliness, adult day services to provide social and recreational activities, and either a live-in caregiver or an institutional living facility.

Last, the USPSTF suggests that potential adverse effects of screening must be considered in assessing overall health impact (USPSTF, 1996). The possible negative effects of screening for dementia have not been systematically evaluated. Based on the findings by the Task Force, false-positive and true-positive screening results could have adverse psychological effects on patients; however, few studies have been performed to explore these outcomes adequately (USPSTF, 2003). One study noted by the Task Force reported that fewer than 5% of patients undergoing a detailed assessment of mental function described the screening itself as distressing, intrusive, or depressing (Jorm et al., 1994). A well-designed study of patient outcomes in response to screening must be conducted in order to appropriately bolster the support for screening.

Recommendations

Based on the literature, the MMSE and Mini-Cog have the most promise in primary care settings. Both tools have been proven to be reliable and valid measures of dementia and exhibit high levels of sensitivity and specificity. The MMSE has a longer average administration time compared to the Mini-Cog; therefore, the Mini-Cog could be utilized in practices that allow very limited time with patients. While the MMSE is subject to age and education-level influence, use of the age- and education-specific cutoff scores eliminated this bias and increased the tool's sensitivity and specificity.

As a number of screening tools either have not been tested at all in the primary care setting or have been tested in a limited capacity, the most important next step would be encouraging providers to engage in studies of the utility of different screening methods that have proven effectiveness in other settings. Ideally, providers would agree to routinely use a particular screening method on all patients over the age of 65 at primary care visits on an annual basis or more often depending on the patients' risk factors or

current functional status. Routine use in numerous primary care offices would provide the adequate number of patients to determine accurate psychometric properties of the tool.

Because providers have so little time to spend with patients when they are seen for routine or sick outpatient visits, it may be more plausible to have nurses administer the cognitive screening tools. Nurses are often the first line of communication with the patients in primary care, responsible for inquiring about their current physical health status. As suggested by Geldmacher (2002), tasks that evaluate memory can be worked into the assessment of vital signs or during a physical examination.

If providers feel that they are ill equipped to diagnose, treat, or manage patients once patients are screened positive for cognitive impairment, there are geriatric and dementia specialists to which patients can be referred. Geldmacher (2002) also suggests referral to a specialist if the treating provider feels unable to perform a complete evaluation himself or herself because of lack of personal know-how or resources. Specialty settings such as memory clinics also have services that go above and beyond what most primary care settings could possibly offer, for example, in-depth AD education, review of caregiver coping skills, behavioral management, community resources, long-term care planning, and legal or financial planning (Aupperle, MacPhee, Coyne, Blume, & Sanchez, 2003). These services treat the patient as well as their caregiver. Memory clinics have been found to be most effective when they have close working relationships with primary care providers (Woods et al., 2003).

Conclusions

Dementing illness, such as AD, will become a common presentation in primary care practice in the years ahead. Currently, routine screening is not performed although acceptable instruments, such as the MMSE and Mini-Cog, are available. Additional research on the routine use of screening tools in primary care to bolster the current evidence, use of nurses as evaluators of cognition, and utilization of specialists for those patients who providers feel ill equipped to diagnose, treat, or manage are needed.

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