Family Medicine 29: 72-year-old male with dementia

User: Jingzhi An
Email: jingzhi.an@u.duke.nus.edu
Date: March 25, 2020 5:18AM

Learning Objectives

The student should be able to:

- Differentiate among the presentations of delirium, dementia, and depression in an older adult patient.
- Interpret at least one standardized instrument (e.g., MiniCog or Folstein Mini-Mental State Examination (MMSE)) to screen for cognitive loss in an older adult patient for whom there are concerns regarding memory or function.
- Describe baseline functional abilities (instrumental activities of daily living, activities of daily living) in an older adult patient with altered mental status.
- Formulate the differential diagnosis for acute change in mental status for a patient with dementia.
- Recognize management options, including pharmacological, non-pharmacological, complementary therapies, and caregiver support for an older adult patient with dementia.
- Recognize caregiver stress and its impact on the care of a patient with dementia.
- Describe therapeutic interventions to prevent or treat delirium in the hospital setting.
- Describe the role of social service, healthcare agencies, hospice, and other community organizations to provide care and assistance to older adult patients with dementia and their families.

Knowledge

Major Neurocognitive Disorder - DSM Criteria

DSM V Criteria for Major Neurocognitive Disorder (previously termed "dementia")

A. Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains:

- Learning and memory
- Language
- Executive function
- Complex attention
- Perceptual-motor
- Social cognition

B. The cognitive deficits interfere with independence in everyday activities. At a minimum, assistance should be required with complex Instrumental Activities of Daily Living (IADL), such as paying bills or managing medications.

C. The cognitive deficits do not occur exclusively in the context of a delirium

D. The cognitive deficits are not better explained by another mental disorder (eg, major depressive disorder, schizophrenia)

Causes of Dementia

Most Common Causes of Dementia

Alzheimer's accounts for approximately 60% of all cases of dementia and is therefore the most likely etiology in most cases. The differential diagnosis of dementia is fairly long, however; and other causes need to be considered. New criteria and guidelines identify three stages of Alzheimer's disease:

1. preclinical Alzheimer's disease
2. mild cognitive impairment (MCI) due to Alzheimer's disease (MCI)
3. dementia due to Alzheimer's disease.

These reflect current thinking that changes in the brain begin years before symptoms are apparent.

Vascular dementia (e.g. due to multiple infarcts) accounts for about 15-20% of causes. Patients with this diagnosis usually have cardiovascular risk factors such as hypertension and tobacco use. Approximately 10% of patients with Alzheimer's dementia also have pathologic findings of vascular dementia and may be considered to have mixed dementia.

Dementia with Lewy bodies (DLB) has recently been recognized as a more common cause of dementia than previously thought, accounting for 10% to 15% of cases at autopsy. In addition to typical symptoms of dementia, patients with DLB manifest fluctuations in alertness and attention (delirium), visual hallucinations, and Parkinsonian symptoms.

Less Common Causes of Dementia

- Parkinson's disease is a cause of dementia late in the course of the disease, with the prominent motor symptoms starting years before. This sequence distinguishes dementia from Parkinson's from DLB, in which the Parkinsonian symptoms and dementia begin simultaneously. Patients presenting with dementia without the classic findings of Parkinson's are unlikely to have Parkinson's disease.
- Frontal temporal dementia, such as Pick's disease, differs from Alzheimer's because, as the name implies, this type of dementia presents with more frontal lobe symptoms (such as changes in personality, demeanor, and behavior).
- Other rare forms include Huntington's disease and Creutzfeldt-Jakob disease. Huntington's disease follows an autosomal dominant pattern and therefore typically has a strong family history. Its initial presentation is characterized by random, jerky and uncontrollable movements (choreiform movements). Creutzfeldt-Jakob disease is an extremely rare, rapidly progressive infectious condition transmitted by a prion.

Ankle Clonus

A series of abnormal alternating contractions and relaxations of the foot induced by sudden dorsiflexion of the foot. Its presence is suggestive of upper motor neuron pathology.

Caregiver Stress

- Caregiver stress has been increasingly recognized as a risk factor for morbidity and mortality. For example, a prospective study demonstrated that older spousal caregivers who report emotional strain have a relative risk of mortality of 1.63 over four years, compared to non-caregivers. Depression, anxiety, and use of psychotropic medications have also all been demonstrated to be more common among caregivers.
- Formal tools to identify caregiver stress have not been developed for primary care settings. As such, direct questioning of the caregiver is recommended to identify the level of perceived burden. This should include screening for anxiety and major depression. Additionally, physicians should identify the level and types of external support the caregiver is receiving (e.g. family member or home health aid visits).
- Respite care may be extremely helpful. This can involve either a family member or a paid professional taking care of the disabled patient for a block of time, thereby allowing the caregiver a break for recreation or for the completion of tasks that are difficult with the disabled patient. Enrolling the patient in an adult day program is the most structured form of respite.
- Caregiver support groups may also be helpful. Such groups allow caregivers to share experiences, challenges and solutions with other people in similar circumstances.
- Knowing how to find resources for disabled patients and their caregivers is an essential tool for the family physician. One such resource is the Family Caregiver Alliance, which maintains an online listing of respite, home care, palliative care, and caregiver support services by state. The US Department of Health and Human Services also maintains a listing at www.eldercare.gov.

Financing Home and Long-Term Care Services

Skilled home services

Medicare and most private insurances will cover a short stint of skilled services at home. Skilled services are those provided by licensed providers such as nurses, physical therapists, speech therapists, etc...

Other home services

Home care agencies also provide home health aides, who help with ADLs such as bathing and dressing; homemakers, who assist with some IADLs such as laundry, light housework, and errands; and companions, who provide sitting and respite services. These types of services are not covered by most insurance plans, and generally cost between 15 and 30 dollars an hour. To pay for them, some patients who own their own houses enter into a reverse mortgage, in which the home care is paid for gradually from the value of the house, all the while allowing them to stay at home.

Long-term care such as nursing home or adult day program

If there is a need for skilled services, Medicare will cover 100% of the cost for the first 20 days of a nursing home stay after a hospitalization.

Long-term care is not covered at all, however. Adult day programs cost anywhere from 50 to 100 dollars a day, while nursing homes cost between 150 and 250 dollars a day. Most states have payment assistance programs to help families that cannot afford these rates, but still the costs can be prohibitive. It is not uncommon for a family to work through their entire life savings paying for long-term care. Eventually, they qualify for Medicaid, which picks up the remaining cost. Nowadays, many families are considering purchasing separate long-term care insurance policies that cover these types of services.

Primitive Reflexes

Patients with advanced dementia or other neurodegenerative diseases may develop primitive reflexes with loss of frontal lobe control. Primitive reflexes are those that may be seen in infants, including grasp, suck, and the "glabellar tap" (patient continues to blink each time he or she is tapped on the forehead; healthy patients stop blinking after the second or third tap).

Management

UTI Treatment

UTI Treatment

Treat UTI with IV ceftriaxone after making certain that the urine sample gets sent for gram stain and culture.

Delirium Treatment

Delirium Treatment

Prescribe a short course of oral haloperidol, which is helpful in aiding sleep, diminishing agitation, and clearing hallucinations.

Some providers prefer newer atypical antipsychotics such as olanzapine and quetiapine, which have fewer extrapyramidal side effects. There is a recent systematic review of the efficacy and safety of the off-label use of atypical antipsychotic medications for various conditions. For symptoms such as psychosis, mood alterations, and aggression associated with dementia in elderly patients, small but statistically significant benefits were observed for aripiprazole, olanzapine, and risperidone. However, these agents can lead to a prolonged QT interval and don't have the long track record of haloperidol.

Side effects of haloperidol:

- Somewhat sedating and can cause constipation.
- Tardive dyskinesia - involuntary spasms of the neck, tongue and lips. Generally seen in patients on higher doses of this medication for a long time (such as over a year).
- QT prolongation - rare.

Hospital Interventions That Can Prevent or Minimize Delirium

Frequent reorientation and redirection by a familiar provider	Providing a safe environment for agitated and combative patients is a challenge for physicians and nurses. Frequent reorientation and redirection by a provider who is familiar with the patient can be very effective in reducing agitation. Nurses on a regular hospital ward typically have responsibilities for too many patients to redirect effectively a delirious patient. A one-to-one sitter provides a safe alternative that can minimize the use of physical and chemical restraints. Repeated reorientation, by a sitter, family member, nurse, or doctor can help reduce confusion. Review of a multifaceted hospital-unit-wide intervention (compared with two "usual care" units) showed a reduction in the number and duration of episodes of delirium. One element of the intervention was an orientation protocol that included frequent cognitive stimulation and active orientation.
Avoid medications that can lead to delirium	As you recall from earlier in the care of this patient, a wide variety of medications can lead to delirium. Sedating medications and those with anticholinergic side effects (e.g. narcotics, benzodiazepines, and tricyclic antidepressants) should generally be avoided in patients at risk of delirium, unless they are absolutely necessary (e.g., narcotics for post-operative pain). The updated American Geriatrics Society Beers Criteria is an evidence-based review of potentially inappropriate medications for older adults and providers should consider avoiding drugs on this list.
Provide early mobility and range of motion exercises	Providing early mobility and range of motion exercises to bedridden patients can help prevent delirium. Such exercises provide physical touch, cognitive and sensory stimulation, and can prevent decubitus ulcers.
Minimize unnecessary lines, cables, and catheters	Foley catheters, while preventing urinary incontinence in bed, can be uncomfortable and provide noxious stimuli that can augment delirium. Additionally, these lines and wires can lead to preventable falls. The same may be said for oxygen tubing, IV lines, telemetry monitors, and, particularly, physical restraints. All of these may be used when there is no alternative, but they should be discontinued as soon as safely possible.
Provide increased stimulation	Placing a patient at the end of the hall where it is dark and quiet at night would not be helpful. Mounting evidence suggests that sensory deprivation is a contributing factor to delirium in the hospital. Interventions that increase, rather than minimize, stimulation seem effective at preventing or minimizing delirium. As such, keeping patients in rooms with adequate lighting, windows, large clocks, and calendars helps keep the patient calm and more oriented. Keeping the patient close to the activity of the nursing station is also helpful. Visual and hearing disturbances can contribute to delirium. Dim lighting, ambient noise, and the removal of hearing and visual aids therefore should be avoided.

Treatment of Alzheimer's Dementia & Symptoms

Cholinesterase inhibitors	Four cholinesterase inhibitors (donepezil, rivastigmine, tacrine and galantamine) show statistically significant, though clinically small benefits for patients with mild to moderate dementia. Studies have demonstrated improvements in MMSE, ADL, and IADL scores, but the improvements are small enough that most families and clinicians will be unable to detect them. A recent meta-analysis demonstrated that a physician would need to treat 12 patients with mild to moderate Alzheimer's dementia for one to achieve minimal improvement or better,

	and for one to have a treatment-related side effect. A systematic review in 2008 concluded that cholinesterase inhibitors lead to statistically significant but "clinically marginal" effects.
Vitamin E	The use of vitamin E in the treatment of dementia is controversial. One large trial (the Alzheimer's Disease Cooperative Study) of 2000 IU daily demonstrated a delay in the onset of death, institutionalization, or progression to severe dementia of 670 days compared to placebo among patients with moderate to severe dementia. Due to this study, the American Academy of Neurology recommends the use of Vitamin E in the management of dementia. Concern has arisen from a recent meta-analysis of vitamin E supplementation that demonstrated a rise in all-cause mortality. A 2012 Cochrane Collaboration review concluded that there was no convincing evidence that Vitamin E is of benefit in the treatment of Alzheimer's dementia. Clinicians should discuss the potential risks and benefits with patients and their families on an individual basis.
Memantine	Memantine (Namenda) is an N-methyl d-aspartate (NMDA) receptor antagonist that is FDA-approved for use in moderate to severe dementia. Randomized trials suggest that, like the cholinesterase inhibitors, memantine leads to small but statistically significant improvements in cognition. The clinical relevance of the improvements is not clear, but the medication is generally well tolerated and there are few other options. It may be used in combination with cholinesterase inhibitors in patients with severe dementia. A 2011 systematic review found no evidence that memantine is effective in mild Alzheimer's and only meager evidence of its efficacy in moderate Alzheimer's.
Respite	For community dwelling patients with dementia, providing support and respite to their caregivers is essential to their care. Respite care may take a variety of forms. For a family with ample local support, simply having family members take turns replacing the primary caregiver is inexpensive and effective. Patients may pay to have a home health aid come at various intervals. Such aids can provide assistance with specific non-medical tasks such as bathing, shopping, and laundry, or they may simply allow the primary caregiver to leave for a while. The most structured form of respite is an adult day program. Such programs provide all the services available in a nursing home (e.g., nutrition, nursing, medication management, recreation) but only during work hours on weekdays. Such programs may allow a patient with advanced dementia to delay long-term institutionalization.
Atypical antipsychotics	Behavioral disturbance (such as aggression or psychosis) is a common and difficult problem as dementia progresses. Careful identification of exacerbating factors can lead to specific approaches to alleviate the problem (e.g. recognition and treatment of constipation leading to agitation). However, medications often have a role in the management of behavior. The atypical antipsychotics olanzapine (Zyprexa) and risperidone (Risperdal) appear to have a modest benefit in managing such neuropsychiatric symptoms and are commonly used. Two recent studies have suggested that patients given atypical antipsychotics have a slightly higher risk of death. In 2006 the FDA placed "black box" warnings on the labeling for these medications and the conventional antipsychotics (such as haloperidol) indicating the increased risk of death among elderly patients with dementia. Because of this, it is important to attempt behavioral treatments first and to openly discuss the goals and risks of treatment with patients' families prior to starting these medications. For some families, managing severe behavioral symptoms using a medication with a known mortality risk is preferable to the alternative of living with the symptoms. Additionally, providers should understand that the increased mortality concerns come from data about the long-term use of antipsychotics in chronic behavioral disturbance. The safety of these medications in the acute management of delirium should be considered separately.

Cognitive rehabilitation therapy has not been demonstrated to be helpful in slowing the progression of Alzheimer's dementia. A recent Cochrane Collaboration systematic review published in 2003 concluded that there was no evidence to support its use, though it pointed out that the number of existing randomized trials is limited.

A 2007 Cochrane Collaboration systematic review concluded that the evidence for gingkgo biloba's role in the management of dementia is "inconsistent and unconvincing."

Asymptomatic Bacteriuria

Asymptomatic bacteriuria is very common in older patients. There is no evidence that treating it helps. As many as 50% of older men will have a positive urine culture within six weeks of treatment for a UTI. As such, there is no need for a test of cure. If an older patient has a UTI, and then has similar symptoms again, he will need a urine culture at that point.

Studies

Dementia - Diagnostic Testing & Neuroimaging

Role of diagnostic testing

The role of diagnostic testing in the setting of a patient with dementia is primarily to rule out treatable causes, which occur in less than 1% of cases of dementia.

- Depression is commonly comorbid with dementia symptoms and is widely recognized as a cause of "pseudo-dementia." The Geriatric Depression Scale is a well-validated screening test for depression in older patients that may be used to rule out depression.
- Other tests recommended by leadership groups include:

1. complete blood counts
2. basic chemistries
3. calcium
4. thyroid
5. vitamin B12 deficiency testing
6. Folate deficiency can cause dementia, but is now extremely rare in North America due to the widespread fortification of grain products with folate. Testing for folate deficiency is therefore no longer recommended.
7. Syphilis testing may be performed if there is a clinical suspicion or if the local prevalence is high.

Role of neuroimaging

Neuroimaging with either noncontrast computed tomography (CT) or magnetic resonance imaging (MRI) has not been clearly demonstrated to be beneficial in the diagnosis of dementia, but can rule out structural defects (e.g., tumors or normal pressure hydrocephalus) and vascular causes. The American Academy of Neurology therefore recommends the use of either one of these tests in patients for whom these diagnoses are a concern. Currently, no guidelines recommend the use of functional MRI, positron emission tomography (PET) scans, or single photon emission computed tomography (SPECT) scans in the diagnosis of dementia.

Non-Specific White Matter Changes on MRI

Non-specific white matter changes are a common finding on MRIs of the brain. They represent microvascular disease, which may be caused by hypertension, smoking, obesity or simply by aging. They are commonly found in asymptomatic individuals and are often felt to be clinically irrelevant.

The Clinical Dementia Rating

The Clinical Dementia Rating or CDR was developed for the evaluation of the severity of dementia, primarily for use in persons with dementia of the Alzheimer type (the equivalent of probable Alzheimer's disease). It can also be used to stage dementia in other illnesses as well. The protocol is based on interviews of the patient and caregiver. The areas tested are memory, orientation, judgment, community affairs, home and hobbies, and personal care. The CDR is a five-point scale:

0	No cognitive impairment
0.5	Very mild dementia
1	Mild dementia
2	Moderate dementia
3	Severe dementia

Diagnosing Delirium

The **Confusion Assessment Method (CAM)** has been widely used over two decades and is the predominant tool used in clinical research regarding delirium.

A recent systematic review of assessment tools in diagnosing the presence of delirium demonstrated that the best evidence supports use of the CAM, which takes five minutes to administer. The CAM has a summary-positive likelihood ratio of 9.6 (95% CI, 5.8 - 16.0) as a bedside delirium instrument.

The MMSE, which has been widely used clinically during the same time period, is a multidimensional tool to assess cognitive function, and was not developed specifically for the assessment of delirium. In the same study mentioned above, the MMSE was the least useful in identifying a patient with delirium (likelihood ratio, 1.6; 95% CI, 1.2 - 2.0).

A newer test, the Montreal Cognitive Assessment (MoCA), has been proposed to be a better alternative than the MMSE to assess cognitive function.

Functional Status Assessment

Functional status assessment is traditionally divided into evaluation of Activities of Daily Living (ADL, or skills required for basic living) and Instrumental Activities of Daily Living (IADL, or skills required for living independently).

ADLs	**IADLs**
• bathing • dressing • transferring	• shopping • preparing meal • using the telephone

• continence • toileting • feeding	• managing transportation needs • managing medications • managing finances
The most basic skills that patients need to stay independent and live at home. They represent one's basic personal care and physical ability.	These don't have to be done on a daily basis, are not as severe a threat to independent living, and other people can be hired to do them. They typically require a cognitive component in addition to physical ability.
They are usually acquired by the first time one leaves home (about 5 or 6 years old, or kindergarten age).	They are usually acquired by the second time one leaves home (about 16-17 years old, beginning college or career).
	Over 50% of people over the age of 75 have at least one IADL deficit.

Screening for both ADLs and IADLs includes asking the patient if he/she has any problems with each activity; and, if so, who helps? Ask: "Do you have any problems with...? If you have problems, then who does it for you?" Some providers use a standardized form to assess a patient's functional status. (See example.)

MMSE Calculation

Scoring the MMSE should be familiar to most clinicians due to its wide use. The U.S. Preventive Services Task Force (USPSTF) concludes that the evidence is insufficient to recommend for or against routine screening for dementia in older adults (Grade "I" recommendation). It should be noted that in the case of Mr. Marshall, you are not screening. He has symptoms of a change in mental status, so you are doing the MMSE for diagnosis.

Providers commonly perform the attention and calculation part of the MMSE incorrectly. Providers are intended to ask *all* patients to perform the serial 7s. Those who do not correctly complete this entire sequence (93, 86, 79, 72, 65) should be asked to spell "WORLD" backwards. The scorer then uses the better of the two scores. Using the better performance accommodates for the fact that some people are naturally more gifted with literacy than numeracy, and vice versa.

Weiss, BD. Diagnostic evaluation of urinary incontinence in geriatric patients. *Am Fam Phys*. 1998;57:2675-88.

Pneumonia on Chest X-ray

Pneumonia typically appears on chest x-ray as a density in one of the lung fields.

When a consolidated pneumonia rests up against solid tissue, such as the diaphragm, you lose the ability to distinguish the border of that tissue from the lung tissue.

Sometimes air-bronchograms are visible in the infiltrate. Air bronchograms are l inear lucencies within an infiltrate that represent the air within a bronchus that is surrounded by consolidated lung tissue. These are pathognomonic for an airspace illness such as pneumonia.

Particularly in older patients, patients with atypical pneumonia such as Legionella, and patients early in their illness, pneumonia may not be seen on an x-ray. If there is a high clinical suspicion of pneumonia, current guidelines would suggest starting pneumonia treatment and repeating a chest x-ray in 24-48 hours.

Clinical Reasoning

Distinguishing Between Dementia, Delirium, and Depression

Dementia	• Dementia is an acquired syndrome of gradual progressive deterioration in global intellectual ability that interferes with the ability to function in social and occupational roles. • Important elements of the definition include: acquired (i.e., not congenital), progressive (i.e., worse over time), global (not isolated to memory), and interfering with function.
Delirium	• Delirium also causes a decline in cognition, but is particularly notable for acute disturbances in attention (e.g., an inability to shift focus), alertness (e.g., impaired consciousness and sleep cycles) and perception (e.g., hallucinations). • In delirium, the symptoms fluctuate over short periods of time, whereas in dementia the symptoms are slowly progressive.
	• Depression is an alteration in mood, which can be confused with dementia in older patients. It frequently causes a decline in the ability to concentrate, which may worsen memory. Depression also leads to a lack of

Depression	interest and energy, which may appear similar to the symptoms of dementia. Since depression is readily treatable, it is essential to diagnose this condition in patients who present with memory loss. • In addition to representing the primary diagnosis, depression can be comorbid with dementia, and should be considered both because it may worsen symptoms related to dementia, and because it can be reversible.

Differential Diagnosis of Change in Mental Status in a Patient with Dementia

Most Likely Diagnoses

Causes of delirium:

Urinary tract infection (UTI)	UTIs are among the most common causes of delirium in older patients. Such patients are seldom able to identify the common symptoms of UTI's such as dysuria or frequency, so the absence of these symptoms does not rule out this diagnosis. UTIs also may cause or exacerbate urinary incontinence.
Respiratiory infection	Respiratory infections (e.g. pneumonia) frequently complicate dementia and often cause delirium in such patients. The mortality rate of patients with advanced dementia is high and is primarily attributable to infections such as pneumonia and urosepsis. Aspiration pneumonia may also cause delirium.
Electrolyte disturbance	A wide range of electrolyte disturbances may cause delirium (e.g. hypo or hypernatremia, hypercalcemia, hypokalemia, and metabolic acidosis). These conditions are easily detected and highly treatable, so they should always be considered in the work-up of acute change in mental status and delirium.
Urinary retention	Any condition that leads to discomfort may cause delirium in a patient with dementia. Acute urinary retention leads to the complete inability to pass urine. Chronic urinary retention (most commonly due to benign prostatic hypertrophy [BPH]), however, leads to incomplete emptying and distention of the bladder, which further may lead to UTI and overflow incontinence. Risk factors for urinary retention include male sex, age over 70 and BPH. When this is a consideration, a post void residual should be measured (either by catheterization or ultrasound assessment of bladder volume after voiding). Catheterization allows the collection of a urine culture that is unlikely to be contaminated by skin flora. When urinary retention is severe, the bladder may be palpated in the suprapubic area.
Pain	Pain from any source may cause delirium among patients with dementia. This presents a clinical challenge, since the treatment of pain with opiates also can cause delirium. Since patients in this condition are frequently unable to localize and report their symptoms, it is important to do a full physical exam looking for hidden sources of pain (abdominal tenderness, joint or bony injury).
Depression	Depression and other psychiatric conditions can present with altered mental status in older patients; however, psychiatric conditions usually present dif ferently from delirium.
Withdrawal	Withdrawal from medications or other substances is a common cause of delirium. This reaction to withdrawal occurs most frequently from alcohol and benzodiazepines. In these cases, the delirium may progress to a more severe form known as delirium tremens, characterized by tachycardia, hypertension, delirium with agitation, visual hallucinations and formication (the sensation of insects crawling on the patient).
Acute cerebrovascular events	Acute cerebrovascular events such as ischemic stroke or intracranial bleeding may present with an acute change in mental status. This is most likely in a patient with vascular dementia who experiences a new ischemic event. In this case, the vascular event could be small enough to not cause new neurologic symptoms. In combination with the other pre-existing insults, however, the new event may cause an acute alteration in mental status. Large brain insults (e.g. those due to larger ischemic events or acute hemorrhage) typically have associated neurological findings on physical exam (e.g. hemiplegia or upper motor neuron findings - such as hyperreflexia, clonus, or positive Babinski's).
Adverse drug effects	As a group, adverse drug effects represents one of the most common causes of delirium in older patients. Patients with dementia, in particular, are sensitive to medications with sedating effects. Medications with anticholinergic effects (opiates, benzodiazepines, sedating antihistamines, tricyclic antidepressants, antipsychotics, and some anti-nausea medications) are the drugs most likely to cause delirium. Other potential offenders include certain antibiotics (e.g. fluoroquinolones), beta-blockers, and H2-blockers.

References

American Geriatrics Society Updated Beers Criteria J Am Geriat Soc. 2012 http://www.americangeriatrics.org/files/documents/beers/BeersCriteriaPublicTranslation.pdf. Accessed October 21, 2016.

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), American Psychiatric Association, Arlington, VA 2013.

Ballard C, Hanney ML, Theodoulou M, Douglas S, McShane R, et al. The dementia antipsychotic withdrawal trial (DART-AD): long-term follow-up of a randomised placebo-controlled trial. *Lancet Neurol*. 2009 Feb;8(2):151-7.

Birks J, Grimley Evans J. Ginkgo biloba for cognitive impairment and dementia. *Cochrane Database Syst Rev*. 2007 Apr 18; (2):CD003120.

Borson S, Scanlan JM, Chen P, Ganguli M. The Mini-Cog as a screen for dementia: validation in a population-based sample.*J Am Geriatr Soc*. 2003;51(10):1451-54.

Borson S, Scanlan JM, Watanabe J, Tu SP, Lessig M. Simplifying detection of cognitive impairment: comparison of the Mini-Cog and Mini-Mental State Examination in a multiethnic sample. *J Am Geriatr Soc.* 2005;53(5):871-74.

Brodaty H, Low LF, Gibson L, Burns K. What is the best dementia screening instrument for general practitioners to use? *Am J Geriatr Psychiatry.* 2007;15(8):726-27.

Clare L, Woods RT, Moniz Cook ED, Orrell M, Spector A. Cognitive rehabilitation and cognitive training for early-stage Alzheimer's disease and vascular dementia. *Cochrane Database Syst Rev*. 2003;(4):CD003260.

Farina N, Isaac MG, Clark AR, et al. Vitamin E for Alzheimer's dementia and mild cognitive impairment.Cochrane Database Syst Rev. 2012 Nov 14;11:CD002854.

Feil DG, MacLean C, Sultzer D. Quality Indicators for the Care of Dementia in Vulnerable Elders. J Am Geratr Soc. 2007;55:S293-S301.

Feldman HH, Jacova C, Robillard A, Garcia A, et al. Diagnosis and treatment of dementia: 2. Diagnosis. *CMAJ.* 2008 Mar 25;178(7):825-36.

Final Update Summary: Cognitive Impairment in Older Adults: Screening. U.S. Preventive Services Task Force. September 2016. https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cognitive-impairment-in-older-adults-screening. Accessed October 12, 2016.

Fried LP, Tangens CM, Walston J, et al. Frailty in older adults: evidence for phenotype. *J Gerontol Med Sci*. 2001;56A:M146-M156.

Fried LP. Chapter 21-Frailty. In Pacala JT, Sullivan GM, eds. Geriatrics Review Syllabus: A Core Curriculum in Geriatric Medicine. 7th ed. New York: American Geriatrics Society; 2010.

Grafstrom M, Fratiglioi L, Sandman PO, Winblad B. Health and social consequences for relatives of demented and non-demented elderly. A population-based study. *J Clin Epidemiol.* 1992 Aug;45(8):861-70.

Holsinger T, Plassman BL, Stechuchak KM, et al. Screening for cognitive impairment: comparing the performance of four instruments in primary care. *J Am Geriatr Soc*. 2012 60(6): 1027-36.

Inouye SK; Bogardus ST Jr; Charpentier PA; Leo-Summers L; Acampora D; Holford TR; Cooney LM Jr. A multicomponent intervention to prevent delirium in hospitalized older patients. *N Engl J Med.* 1999 Mar 4;340(9):669-76.

Jack CR Jr, Albert MS, Knopman DS, et al., Introduction to the recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. Alzheimer's & Dementia: The Journal of the Alzheimer's Association 2011;7(3):257-262.

Knopman DS, DeKosky ST, Cummings JL, Chui H, et al. Practice parameter: diagnosis of dementia (an evidence-based review): report of the quality standards subcommittee of the American Academy of Neurology. *Neurology.*2001 May 8;56(9):1143-53.

Lanctot KL, Herrmann N, Yau KK, Khan LR, et al. Efficacy and safety of cholinesterase inhibitors in Alzheimer's disease: a meta-analysis. *CMAJ.* 2003 Sep 16;169(6):557-64.

Lieberman JA III, Stuart MR. The BATHE Method: Incorporating Counseling and Psychotherapy Into the Everyday Management of Patients. Primary Care Companion. *J Clin Psychiatry.* 1999;1(2):35-9.

Lorentz WJ, Scanlan JM, Borson S. Brief screening tests for dementia. Can J Psychiatry. 2002;47:723-33.

Maher AR, Maglione M, Bagley S, Suttorp M, Hu JH, Ewing B, Wang Z, Timmer M, Sultzer D, Shekelle PG. Efficacy and comparative effectiveness of atypical antipsychotic medications for off-label uses in adults. JAMA. 2011; 306(12):1359-1369.

Mandell LA, Wunderink, RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis.* 2007;44 Suppl 2:S27.

Matsumoto T. Urinary tract infections in the elderly. *Curr Urol Rep*. 2001;2(4):330-33.

McCue JD. Complicated UTI: effective treatment in the long-term care setting. *Geriatrics.* 2000;55:48-61.

McDaniel SH, Beckman HB, Morse DS, Silberman J, Seaburn DB, Epstein RM. Physician self-disclosure in primary care visits: enough about you, what about me? *Arch Intern Med*. 2007 Jun 25;167(12):1321-6.

McKeith IG, Galasko D, Kosaka K, et al., Consensus guidelines for the clinical and pathologic diagnosis of dementia with Lewy bodies (DLB): report of the consortium on DLB international workshop. *Neurology.* 1996;47(5):1113-1124.

Miller ER III, Pastor-Barriuso R, Dalal D, Riemersma RA, et al. Meta-analysis: high-dosage vitamin E supplementation may increase all cause mortality. *Ann Intern Med.* 2005;142:37-46.

Miller MO. Evaluation and Management of Delirium in Hospitalized Older Patients. *Am Fam Physician.* 2008;78(11):1265-70.

Montreal Cognitive Assessment Tool http://www.mocatest.org/

Nasreddine ZS, Phillips NA, Bédirian V, et al. The Montreal Cognitive Assessment (MoCA): A brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005 Society 53:695-699.

O'Brien JT, Erkinjuntti T, Reisberg B, et al., Vascular cognitive impairment, *Lancet Neurol.* 2003;2(2):89-98.

Parks SM, Novielli KD. A Practical Guide to caring for caregivers. *Am Fam Physician*. 2000;62:2163-2620.

Pearson SD, Ollendorf DA, Colby JA. Amyloid-Î² Positron Emission Tomography in the Diagnostic Evaluation of Alzheimer Disease. *JAMA Intern Med.* 2013 Sept 30

Quick Reference Information: The ABCs of providing the annual welleness visit. Available at http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/AWV_chart_ICN905706.pdf

Raina P, Santaguida P, Ismaila A, Patterson C, et al. Effectiveness of cholinesterase inhibitors and memantine for treating dementia: evidence review for a clinical practice guideline. *Ann Intern Med*. 2008 Mar 4;148(5):379-97.

Sano M, Ernesto C, Thomas RG, Klauber MR, Schafer K, et al. A controlled trial of selegiline, alpha-tocopherol, or both as treatment for Alzheimer's disease. The Alzheimer's Disease Cooperative Study. *N Engl J Med*. 1997 Apr 24;336(17):1216-22.

Schneider LS, Dagerman KS, Higgins JP, McShane R. Lack of evidence for the efficacy of memantine in mild Alzheimer disease. Arch Neurol 2011; 68(8):991-998.

Schneider LS, Dagerman KS, Insel P. Risk of death with atypical antipsychotic drug treatment for dementia: meta-analysis of randomized placebo-controlled trials. *JAMA.* 2005 Oct 19;294(15):1934-43.

Schulz R, Beach SR. Caregiving as a riskfactor for mortality: The Caregiver Health Effects Study. *JAMA.* 1999; 282:2215-19.

Sink KM, Holden KF, Yaffe K. Pharmacological treatment of neuropsychiatric symptoms of dementia: a review of the evidence. *JAMA.* 2005 Feb 2;293(5):596-608.

Sternberg SA, Wershof Schwart A, Karunananthan H, et al. The identification of frailty: a systematic literature review. . *J Am Geriatric Soc*. 2011;59:2129-38.

Stuart MR, Lieberman JA III. *The Fifteen Minute Hour: Therapeutic Talk in Primary Care*. United Kingdom, Oxon: Radcliffe Publishing Ltd.; 2008.

Tariot PN, Farlow MR, Grossberg GT, Graham SM, McDonald S, Gergel I. Memantine treatment in patients with moderate to severe Alzheimer disease already receiving donepezil: a randomized controlled trial. *JAMA*. 2004 Jan 21;291(3):317-24.

The Hartford Institute for Geriatric Nursing, Division of Nursing, New York University. https://www.mountsinai.on.ca/care/psych/on-call-resources/on-call-resources/mmse.pdf

Wenger, NS, Roth CP, Shekelle P, and the ACOVE Investigators. Introduction to the Assessing Care of Vulnerable Elders-3 Quality Indicator Set. *J Am Geriatr Soc*. 2007;55:S247-252.

Wong Cl, Holroyd-Leduc J, Simel DL, Strauss SE. Does this patient appear to have delirium? value of bedside instruments. JAMA. 2010;304(7):779-786.

Woods NF, LaCroix AZ, Gray SL, Aragaki A, Cochrane BB, et al. Frailty: emergence and consequences in women aged 65 and older in the Women's Health Initiative Observational Study. *J Am Geriatr Soc*. 2005;53(8):1321-30.

