

Geriatric Psychiatry Review: Differential Diagnosis and Treatment of the 3 D's - Delirium, Dementia, and Depression

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Published online: 2 May 2013
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Abstract The three D's of Geriatric Psychiatry—delirium, dementia, and depression—represent some of the most common and challenging diagnoses for older adults. Delirium is often difficult to diagnose and treatment is sometimes controversial with the use of antipsychotic medications, but it is common in a variety of patient care settings and remains an independent risk factor for morbidity and mortality in older adults. Dementia may affect a significant number of older adults and is associated with delirium, depression, frailty, and failure to thrive. Treatment of dementia is challenging and while medication interventions are common, environmental and problem solving therapies may have some of the greatest benefits. Finally, depression increases with age and is more likely to present with somatic complaints or insomnia and is more likely to be reported to a primary care physician than any other healthcare provider by older adults. Depression carries an increased risk for suicide in older adults and proven therapies should be initiated immediately. These three syndromes have great overlap, can exist simultaneously in the same patient, and often confer increased risk for each other. The primary care provider will undoubtedly benefit from a solid foundation in the identification,

classification, and treatment of these common problems of older adulthood.

Keywords Psychiatry · Primary care · Delirium · Dementia · Depression · Geriatric · Elderly · Aging · Mental health

Introduction

Sometimes referred to as the three D's of Geriatric Psychiatry, delirium, dementia, and depression represent some of the most common and challenging diagnoses for older adults in primary care. They can be unsettling for patients and their caregivers, they are often challenging to diagnose, and they can impact quality of life. Strategies exist to manage these conditions, but the first challenge is recognizing their sometimes atypical presentations in patients. A great deal of overlap exists between these syndromes and, in some cases, all three can exist in the same patient at the same time (Table 1). Furthermore, a number of other geriatric healthcare issues are linked to the treatment of these conditions. There is still much we have to learn about these diagnoses, however new advances over the past few years can help the primary care provider put these conditions in perspective and make these diagnoses less daunting. The primary care physician is in a unique position to help patients and families recognize these problems and assist in providing guidance on managing symptoms.

This article is part of the Topical Collection on *Geriatric Disorders*

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Delirium

Delirium is a cognitive disorder characterized by the generally acute onset of altered level of consciousness, inattention, disorganized thinking, memory impairment, disorientation, and perceptual disturbances, often with fluctuations in

Table 1 Prominent features and overlap of symptoms in delirium, dementia, and depression

Prominent features	Delirium	Dementia	Depression
Memory problems ^a	+++	+++	+
Sleep disturbance	+++	+/-	+
Poor attention	+++	+/-	+/-
Mood disturbance	+/-	+/-	+++
Sensory or perceptual disturbance	+++	+/-	+/-
Disorientation	+++	++	-
Acute onset	++	-	-
Slow progression	-	+	+/-
Somatic complaints	-	+/-	+
Anhedonia or apathy	+/-	++	++
Fluctuating symptoms	++	-	-
Risk for poor health outcomes ^b	++	+++	+/-

^a Memory problems related to depression typically encompass memory retrieval-related deficits, whereas the primary memory deficit in both dementia and delirium affects both storage (encoding) and retrieval of information

^b Patients with depression that are appropriately identified and managed may have good clinical recovery rates, while delirium is a significant risk factor for future health complications even following resolution of an incident episode, and the natural history of dementia is one of progressive functional decline and clinical complications

symptoms [1•]. A wide range of central nervous system, systemic, or pharmacological causes may precipitate delirium and it is often multifactorial. Delirium is common in the acute care setting but should never be considered a normal part of aging. It is estimated that greater than 40 % of all hospitalized older adult patients experience delirium [1•] and so it is not surprising that this syndrome is often thought of as a hospital-related problem. Delirium also frequently occurs in long term care facilities and in older adults dwelling in the community as well, where the diagnosis is more likely to be missed clinically. Because a great heterogeneity exists among older adults, individuals have variable susceptibility to this condition. Prolonged physiologic stressors and serious disruptions in functionality are associated with higher incidence of delirium. Those who have experienced delirium in the past are more likely to experience it again in the future.

Three types of delirium are commonly described. In its hyperactive form, it is more easily recognized, especially in the acute care setting because associated behaviors of agitation, restlessness, irritability, combative outbursts, and hallucinations that are often disturbing symptoms to the patient's family and are more likely to be perceived as disruptive behaviors by medical and nursing staff. The hypoactive form is often missed clinically because the patient's behaviors of somnolence, decreased vocalizations and motor activity, and cognitive detachment are more difficult to distinguish from other illness related

behaviors. In the hypoactive form, symptoms may be worrisome but are typically less disruptive to caregivers resulting in underdiagnosis. Finally, most presentations are the mixed form of delirium which includes characteristics of both hyperactive and hypoactive subtypes. While the hallmark of delirium is the cognitive syndrome defined above, any other parts of the mental status exam can be affected as well, including changes in mood and affect, thought processes, thought content (e.g., delusions), and perceptual disturbances such as hallucinations. These non-cognitive symptoms may be more prominent than the cognitive deficits and so may lead to misdiagnosis [2]. Some patients are observed to have one or more symptoms of delirium without developing the full syndrome and these patients are sometimes labeled as having sub-syndromal delirium [1•]. One study examined the possibility of identifying a prodrome of delirium in residents of long-term care [3]. The authors found that those who developed delirium were likely to have changes of new-onset perceptual disturbances, disorganized thinking, and worsening cognitive and memory function over the two weeks preceding a delirious episode. There appeared to be a dose-response relationship between the number of observed changes with the likelihood of developing delirium increased [3]. Delirium is an important clinical syndrome to recognize because it is independently associated with increased morbidity and mortality in all of its forms [4•, 5••, 6••]. One validated measure for evaluating delirium in the elderly is the confusion assessment method (CAM) [7]. The CAM is a simple and brief assessment used to diagnose and monitor delirium by evaluating onset of symptoms, inattention, disorganized thinking, and altered level of consciousness [6].

Treatment of Delirium

Delirium will usually resolve over time in patients with supportive care, assuming that the underlying causal condition(s) improve either spontaneously or with treatments. However, unlike the rapid onset of delirium, which typically occurs over hours to days, the resolution often takes weeks to months to clear fully, typically more slowly than other manifestations of the causal condition(s). Treatment requires environmental changes and behavioral support. Redirection without direct confrontation of delusions or hallucinations can be helpful. Restraints of any kind including bed siderails, restrictive furniture, and chemical restraints are associated with increased injuries in older patients [8, 9]. Similarly, the reduction of tethering by discontinuing Foley catheters, IV lines, and sequential compression stockings can be helpful. Sensory deprivation is a major risk factor for delirium and therefore ensuring a patient has their glasses and hearing aids on is an important part of supportive care for delirium patients. The use of antipsychotics for the treatment of delirium is controversial and no unified set of practice guidelines exists to direct clinical interventions.

In cancer patients, there is evidence that short-term high potency antipsychotics are helpful [10]. However, there is also evidence to suggest that the literature does not support the use of antipsychotic in the treatment of delirium in older hospitalized patients [5]. In the United Kingdom, the National Institute for Health and Clinical Excellence recommends short term (less than 1 week) use of the lowest clinically appropriate dose antipsychotics for the treatment of distressed individuals whose harmful behaviors have not responded to other environmental therapies [11]. Return to a familiar setting and known caregivers or involvement of family members is ideal. In fact, discharge from the hospital should not necessarily be delayed solely because of delirium, once underlying contributing factors have been addressed, as long as appropriate care support is available upon return to the home setting.

Delirium is often more difficult to identify and treat in a patient with underlying dementia, however the two often occur together. In fact, dementia puts a patient at risk for delirium during an acute illness and delirium is an independent risk factor for dementia [12•, 13].

Dementia

Unlike delirium which typically is a temporary condition with an acute onset, most types of dementia have a relatively indolent onset and are progressive over months to years. Unlike delirium, dementia is characterized by the relative preservation of level of consciousness, attention, and orientation until quite late in the illness progression. In both conditions, there are observable fluctuations in symptoms during the course of the illness; however fluctuations tend to be less dramatic and more step-wise in dementia. Alzheimer's dementia is the most prevalent cause of dementia, accounting for about 60 % of all dementias [14]. Less frequent, but still common types of dementia include vascular dementia (which in some surveys has a prevalence equaling or exceeding that of Alzheimer's disease), dementia with Lewy bodies, and mixed types of dementia. A milder form of what is thought to be early cognitive decline or "pre-dementia" is called mild cognitive impairment (MCI). People with MCI are usually relatively safe in an independent environment and may even still be working or managing other complex tasks. Many patients with MCI will eventually progress to dementia in time. Age is a major risk factor for dementia—only 1 % of 60 year olds have dementia while at least 35 % of 90-year-olds have the disease [14]. Dementia is associated with memory and executive functioning decline, a decreased quality of life, and systemic symptoms that limit activities of daily living. While the hallmark of dementia is cognitive impairment, non-cognitive manifestations are common and cause much

functional disability and distress, including changes in mood, affect, and psychotic symptoms. These symptoms lead to early patient institutionalization, tremendous caregiver burden, and increased healthcare costs [15].

Timing of diagnosis can be difficult in primary care because patients are often reluctant to bring up worrisome symptoms for fear of losing their independence. When family members begin to voice their concerns, a patient may have already experienced a significant decline. In the primary care office, it may be difficult to adequately appreciate signs of decline during brief interviews. The U.S. Preventive Services Task Force does not recommend for or against routine screening for dementia in asymptomatic older adults [16]. However, any patient who presents with symptoms of memory loss, behavior change, or functional decline should be screened for dementia in the office. There are many validated tools available for screening for dementia in older patients. While many clinicians have experience with the Folstein Mini-Mental State Exam (MMSE) [17], the authors recommend the Montreal Cognitive Assessment (MoCA) which is available in almost 40 different languages and is available free online at: <http://www.mocatest.org/>. The MoCA may be a more sensitive tool for detecting patients with cognitive impairment and identifying those at high risk for developing dementia [18]. The MoCA includes a greater depth of cognitive domains assessed including the addition of a clock-drawing and trail-making test compared to the MMSE. If a patient scores poorly on any screening cognitive assessment, the person should be referred for further neuropsychological testing if available. A routine battery of initial tests including a thyroid stimulating hormone (TSH) level, vitamin B12 level, and metabolic profile may also help clarify any confounding diagnoses. An assessment of hearing, eyesight, and alcohol or drug use should be undertaken. It should not be assumed that older patients are not sexually active and therefore laboratory tests for HIV and syphilis may be appropriate after determining risk factors for exposure. Finally, imaging of the head may also be useful to rule out other intracranial causes of altered mental status.

Treatment of Dementia: Non-Pharmacologic Treatments

Dementia is often a misunderstood diagnosis for both patients and their families. Although we know there are hereditary forms of dementia, most cases are sporadic and little is definitively known about prevention of dementia. A recent study showed that using a computer and participating in moderate physical exercise seem to be protective [19]. Those with more extensive educations and higher intellectual functioning are thought to progress at the same rate as others although their disease may seem less severe in earlier stages because of their greater cognitive reserve [20]. There is enough evidence refuting any significant preventative effects of ginkgo biloba,

fish oil and other antioxidants, vitamin supplementation, and NSAIDs on cognitive decline that the authors do not support their use in the treatment of dementia [21–25].

Once a diagnosis of dementia is confirmed, the primary care provider should make an effort to emphasize that treatments for dementia are aimed at increasing patient safety, functionality, and quality of life while reducing patient harm and caregiver stress. There is no treatment that will cure or reverse the symptoms of the disease but some treatments have been shown to slow the progression of the disease. The first initiative in treating the patient is education of the patient and their caregivers about the disease. A useful resource is the National Alzheimer's Association which has local chapters in all US states and territories, a website: <http://www.alz.org/>, and a toll-free hotline: (800) 272-3900. Secondly, the initiation of environmental safety measures is key to the successful treatment of dementia. If the patient is still driving, a formal driving evaluation is recommended. An unbiased assessment of driving also makes conversations easier when it becomes necessary for the patient to discontinue driving for safety reasons. A home safety evaluation may be appropriate as well, especially for patients who are living independently at the time of diagnosis. Regular exercise, the availability of social supports, and a consistent environment can help the patient maintain functional independence [9]. Structured behavioral therapy for the patient and the family can be useful. Problem solving therapy rather than supportive therapy has been shown to be more helpful to patients with dementia [26•]. Specific behavioral treatments should be used to target specific behaviors or other non-cognitive manifestations of dementia. In addition, therapists with specialized training in geriatrics are well prepared to address the unique needs of this special population.

Capacity Evaluations and End-of-Life Planning

All patients diagnosed with dementia should be offered end-of-life planning services. Persons with end-stage dementia should be enrolled in hospice or offered similar services to assist with comfort and the preservation of quality of life at the end of life [9]. Research has shown that patients placed on hospice do not have necessarily have shortened survival compared to those who are not offered hospice, however patients enrolled in hospice services in nursing homes are twice as likely to receive daily pain treatment, less likely to be physically restrained or have feeding tubes, and families have greater satisfaction with the end-of-life care of their loved one [27]. When assessing patients with delirium, progressive dementia, and depression, the assessment of decision-making capacity may become a significant issue.

Decision-making capacity should not be confused with competency which has a legal definition representing global functioning and is decided in court. Capacity evaluations are

dynamic and are within the primary care physician's scope of practice. A capacity assessment is meant to assess the specific ability of an individual to make a decision about a healthcare decision at a given point in time [28–30]. For example, an individual may not have capacity to live in an unsupervised setting in the community but they may have capacity to decide which clothes to wear or which foods to eat. The best way to assess capacity is to have a conversation with the patient. The topic of the conversation is the specific healthcare intervention in mind (for example, you may wish to assess the patient's capacity to decide whether or not to have a surgical intervention). First, you must assess the patient's ability to communicate. Once the ability to communicate has been established, a determination of the patient's understanding of the proposed care is in order (for example, do they understand which surgery is being proposed and why this surgery has been recommended?). Next, question whether the patient understands how the intervention applies to them personally (for example, does the patient understand the risks and benefits of the procedure?, can they explain what might happen to them if they proceed or if they choose not to?). Third, the patient must be able to express a choice or decision about their care. Lastly, once those decisions have been expressed, explore the patient's rationale for their decision—are they able to offer a reason for their decision that is consistent with facts and their personal values and beliefs? (for example, your patient may express a morbid fear of “being cut open” and may decline surgery to correct a potentially fatal problem because they would rather “die in their own bed than on the operating table”). It is essential that the physician put aside his or her own personal feelings and beliefs about what is best for the patient in order to remain impartial and objective during a capacity assessment [30]. In addition, it is important to remember that capacity should be reassessed frequently whenever there is a change in clinical condition or when another major health decision presents itself [28]. When a patient has failed to demonstrate capacity about a particular decision, and a health care proxy is not available, mechanisms should be in place to ensure the patient receives necessary care [30].

Medications for the Treatment of Dementia

There are four currently available FDA approved medications for the treatment of moderate dementia. Three are cholinesterase inhibitors: donepezil, rivastigmine, and galantamine; the fourth is memantine, an N-methyl-D-aspartate receptor noncompetitive antagonist [14]. Before starting a patient on any of these medications, a thorough review of their current medications is in order for possible drug-drug interactions. Given the prevalence of polypharmacy in older patients [31, 32], the potential benefits and risks must be weighed in each

individual patient and these medications may be contraindicated in patients with heart disease, renal dysfunction, hepatic impairment, seizure disorder, and peptic ulcer disease. Even when not directly contraindicated, many patients will experience side effects necessitating discontinuation such as dizziness which increases risk of falls, GI upset, insomnia, and mood changes. Therefore, it is recommended that patients are started on the lowest possible dose and gradually tapered up to an effective dose if tolerated. Often, one of the more difficult decisions for family members to make is when to discontinue these medications in their loved one who has tolerated these medications well but have advanced in their disease progression to the point that it is not clear that the medications are making a significant difference in disease progression any longer. Again, the answer must be considered on an individual basis and it is recommended that the patient is tapered off their medication slowly to avoid withdrawal symptoms. Some patients will tolerate discontinuation without difficulty while others may have a more noticeably sharp decline in functioning. The primary care provider should help the family anticipate this uncertainty before discontinuation of these medications. There is no evidence to suggest that these medications are helpful once the patient has progressed to end-stage dementia. Furthermore, these medications have not shown to be helpful in the management of behaviors associated with advancing dementia. Patients with dementia and mood disorder warrant a trial of medication, typically a selective-serotonin-reuptake-inhibitor (SSRI). In general, benzodiazepines should be avoided in older adults, especially those with dementia as they can increase confusion and risk of falls.

The Use of Antipsychotics in Dementia

The use of antipsychotics in dementia has become a controversial issue. More than 10 % of all hospitalizations in the setting of dementia are related directly to behavioral issues [9]. Dementia associated behaviors such as physical and verbal aggression, wandering, hoarding, disinhibition and calling out can be distressing to patients, cohabitants, family members, and staff. Non-pharmacological approaches are always the preferred initiate treatment strategies. Patients with behaviors should be assessed and common causes of agitation should be excluded or addressed including: pain, hunger, boredom, isolation, toileting needs, subclinical infection, and fluctuations in blood glucose or blood pressure [9]. When other issues have been addressed, relocation to familiar surroundings and caregivers may be helpful. Some elders with dementia benefit from a transitional object such as a baby doll or stuffed animal; others may be calmed if given a simple task such as folding towels or coloring with crayons. Repositioning and gentle redirection can similarly be helpful. In cases where non-pharmacologic interventions

were unsuccessful, antipsychotic meds have traditionally been used to treat the neuropsychologic symptoms of dementia. In 2005, the US Food and Drug Administration issued black box warnings for the use of antipsychotics in dementia due to the increased incidence of cardiovascular events and death [15]. There is still controversy surrounding the effectiveness of these medications for behaviors associated with dementia. Most experts feel a trial of these medications may be warranted in dementia patients with a history of psychosis, mania, distressing hallucinations or overt psychosis [9]. Most studies report no more than a 35 % improvement above baseline in other behaviors associated with dementia in older adults [33]. There seems to be no difference in effectiveness between atypical and conventional neuroleptics, therefore the choice of agent often relies on potential interactions with other medications, risk by comorbidity, and side effect profile [34]. Despite some modest improvement in symptoms, these medications are associated with obesity and diabetes mellitus, hip fractures and falls, cataracts, tardive dyskinesias, acute dystonia, parkinsonism, stroke, acute myocardial infarction, and death [9]. Therefore it is necessary to have a discussion with the patient's family or health care proxy before initiation to ensure informed consent for treatment. At least two studies have shown that almost half of family members felt they were not well informed about the potential side effects of antipsychotic use in their family members [34]. Once the decision is made to try these medications, patient should be monitored for extrapyramidal symptoms, diabetes, and prolongation of the QTc by ECG [34]. Long term care regulations require a trial gradual dose reduction of antipsychotic medications. Multiple studies have shown relapse of targeted behaviors with the withdrawal of antipsychotic medications which may indicate that for patients who truly need and benefit from these medications, they can be useful as long as the family accepts the associated risks [35].

Consequences of Dementia: Failure to Thrive and Frailty

As dementia progresses, families often have a difficult time linking the physical manifestations of dementia with the cognitive decline. It is important to emphasize with patients and their families that dementia is a systemic illness that affects much more than the mind alone. As dementia progresses, older adults lose functionality and the ability to care for themselves. Initially dementia may be associated with a preference for sweets and increased feeding [9]. Eventually, that pattern disappears and most patients with dementia will become anorectic and lose weight. It may take up to 45 minutes to feed a person with dementia due to slowness and difficulty remembering to swallow [9]. Finger foods, supplementation, and a softer consistency diet may improve nutritional intake for a little while [9]. However, the natural

progression of the disease is associated with decreased intake and associated nutritional decline. The authors do not recommend the use of feeding tubes in these declining patients as they tend to increase hospitalizations and prolong life without improving quality of life. Nutritional supplements such as multivitamins have not been shown to improve outcomes in older patients, can lead to polypharmacy, and may actually be harmful in some cases [36]. It is more reasonable to lift any dietary restrictions in place (e.g., low sodium, diabetic diet) and educate the patient's family about natural decreased oral intake associated with end-of-life. The associated nutritional decline leads to decreases in natural immunity and weakness of the body's tissues. These patients are at risk for loss of lean muscle mass, muscle contractures, and skin breakdown despite the best available care and attention. When a patient exhibits decreased oral intake, weight loss, loss of muscle mass, and evidence of malnutrition, they have developed the geriatric syndrome called adult failure to thrive (AFTT). Like end-stage dementia, AFTT may be a hospice qualifying diagnosis.

Another syndrome that is closely connected with dementia and adult failure to thrive is frailty [37]. It was once thought that growing older was synonymous with growing frail. However we now know that not all people will become frail as they age in the same way that not all people will experience cognitive decline and dementia. Frailty results from the interactions of multiple medical and functional problems and presents with the following five conditions: unintentional weight loss, slow movement, fatigue, weakness, and low physical activity [37–39]. Patients who exhibit only one or two of these conditions are classified as pre-frail [40]. Frailty and pre-frailty are associated with clinically significant anxiety and depression when compared to more robust older adults even when controlling for age, gender, and a history of previous mood disorder [40]. Like frailty, delirium and dementia both are associated with higher levels of depression also.

Depression

Delirium and dementia are both associated with higher rates of depression. In fact, depression may be a predictor for cognitive decline [41••] and has been associated with white matter changes in older adults [42••]. This relationship is particularly important for the primary care provider to recognize and understand because more than 10 % of older adults seen in primary care offices suffer from depressive disorders [43]. Of all the office-based visits made for depression, 64 % are to primary care physicians [44]. Depression may be more difficult to detect in older patients because their presenting symptoms are less typical and are often mild or subsyndromal. Still, it is imperative that depressed older

patients be identified and treated because treatment may improve quality of life, decrease risk for future morbidity and decrease the risk of completed suicide.

Recognition of Depression in Older Adults

It is important that primary care providers do not adopt the mistaken belief that depressive symptoms are a normal reaction to the losses associated with aging [45]. Nor should signs of mild or subsyndromal depression be ignored. Older patients often deny feelings of depression or anxiety when asked directly and are more likely to present with vague or nonspecific symptoms [45]. In older patients presenting with subsyndromal depression combined with a history of depressive symptoms and impaired functional status, there is a significant risk that they will go on to develop major depression and thus early intervention may prevent worsening morbidity later [43]. The longer symptoms of subsyndromal depression persist, the more likely an older patient is to develop major depression [46]. However, there are modifiable interventions, such as exercise programs, therapy interventions, and medications that can help prevent progression [47•].

Major depressive disorder may present differently in older adults compared to younger adults, and risk factors change as well. As adults age, the gender difference in depression begins to equalize and depression rates appear to increase in both sexes after age 65 years old [48]. There is some evidence that older adults who develop depression later in life may be at increased risk for relapse and therefore may require on-going maintenance therapy [43]. Somatic complaints of pain, unintentional change in weight/appetite, chronic constipation, irritability, agitation, fatigue, headache, insomnia, hypersomnia, and weakness are all typical presenting symptoms of depression in older patients [48]. In-office screening for depression should be done for any patient presenting with symptoms of depression. The Geriatric Depression Scale (GDS), the 9-item Patient Health Questionnaire (PHQ-9), and the Cornell Scale for Depression in Dementia, are all validated tools for screening for depression in older adults [9, 48]. If an older adult screens positive for major depression, treatment with medication and/or therapy is clearly indicated. It is also important to keep in mind that up to 50 % of caregivers of older adults experience depressive symptoms as well [48]. At the time a depression screen is undertaken, the patient's sleep should be assessed also since it is one of the most common symptoms of depression in the elderly and another independently significant health concern of older patients is sleep disturbance.

Insomnia and the Development of Depression

There are normal changes in sleep that occur with aging and they include: decreased total sleep time, reduced sleep

efficiency, decreased slow wave and REM sleep, increased incidence of napping/falling asleep during the day, and being less tolerant of phase shifts in the sleep-wake cycle such as jet lag and shift work. However these changes usually occur in healthy individuals by age 60 years old. Therefore new or significant changes in sleep in individuals over the age of 65 should prompt further evaluation [49]. Circadian rhythm sleep disorders are not a normal part of aging but often are found in older adults complaining of insomnia. The hallmark of these disorders is the presence of relatively normal sleep that occurs at abnormal times [50]. Without another confirmed sleep disorder in older adults, insomnia is associated with at least a three-fold increase risk of developing major depression [51]. Insomnia that develops after a stroke is associated with an increased incidence of suicidal ideation [52]. Self-reported poor sleep quality alone was associated with increased mortality at one year [53••]. Suspicion for a sleep disorder should prompt a sleep medicine consult as sleep disorders can also contribute to cognitive decline [9]. Once co-morbidities are addressed, if insomnia persists, it should be addressed and like treatments for depression, older adults are more likely to seek help from their primary care provider than from a mental health professional.

Whenever possible, non-pharmacologic treatments for insomnia should be initiated first. Many of these methods can be taught in the office or can be initiated via referral to a sleep specialist. Sleep education and sleep hygiene techniques are a variety of behavioral interventions designed to promote healthy sleep such as going to bed and getting up at the same time each day and avoiding daytime naps. Cognitive behavioral therapy (CBT) has been shown to be effective in promoting healthy sleep [54]. Additional therapies such as sleep restriction-compression therapy, stimulus control, and relaxation therapy have also been shown to help promote sleep [50]. Bright light therapy has shown promise in several studies and probably requires at least 1-2 hours of exposure of 1000 or more lux intensity light [9, 55]. However, no consensus exists about the strength and duration of treatment. At least one author recommends early morning exposure for patients having difficulty falling asleep and evening exposure for patients with difficulty staying asleep [55]. There is some evidence that melatonin may be effective for initiating sleep in older adults as well [56]. Patients may seek a quick fix for treating insomnia and it may be tempting to consider writing a prescription for a sleep aid medication. Unfortunately, prescription and over-the-counter sleep aids, such as diphenhydramine, are relatively contraindicated in older adults due to the potential for drug interactions, falls, and confusion; they tend to be habit-forming, and do not promote the lasting changes in sleep quality that behavioral interventions do [55]. Once the risks and benefits are reviewed with a patient and if the decision

is made to start a sedative-hypnotic medication for the treatment of insomnia, it is important to choose one with a short half-life, to start at the lowest dose possible, and to continue for the shortest duration necessary [55]. When the medication is discontinued, it should be tapered off slowly to avoid withdrawal effects. In addition to screening for insomnia, all depression screens must address suicide risk.

Suicide Risk

Older adults have among the highest rates of suicide for all age groups in the United States [57]. Five to 10 % of older adults experience suicidal ideation but that rate rises to 30 % when we only consider older adults with a diagnosis of major depression [58]. Those with lower socioeconomic status are also more likely to experience suicidal ideation [58] as are those who have experienced cerebral microbleeds [59•]. Suicidal ideation is important to recognize because it is a predictor of suicide attempts in older adults. In younger adults, there is a strong association between substance abuse and suicide. This association is largely unstudied in older individuals possibly because it has been assumed that older adults are less likely to abuse substances [60]. There is evidence that among older adults with known substance abuse problems, up to 10 % developed this habit later in life [60]. Therefore, the authors recommend screening for alcohol, illicit drug use, and prescription drug abuse in older patients, especially those with depression and suicidal ideation. Depressive symptoms and suicidal ideation are most likely to be reported to a primary care physician than to any other health care professional [57, 58]. In order to accurately assess suicidal ideation in older adults, the issue must be addressed directly by the primary care provider since older adults are less likely to report suicidal ideation spontaneously but are likely to be honest when asked [57]. Nearly 40 % of patients over the age of 65 years who died by suicide had directly reported a wish to die to a medical provider during the previous year [57]. Therefore, it is important to screen for depression and suicide in the primary care practice and even more important to begin treatment.

Therapeutic Interventions to Treat Depression and Prevent Suicide

The two mainstays of treatment for depression and suicide are medications and psychotherapy. Both are beneficial in combination or individually. Despite the fact that patients and providers may be reluctant to start antidepressant medications in older patients, these therapies have been shown to be safe and effective for older adults [61, 62]. Of older patients treated with antidepressants 50-65 % will improve as a consequence of treatment [61]. The selective serotonin

reuptake inhibitors (SSRIs) are typically chosen as first line therapy because of their low side effect profile. As with all medication initiation in older adults, it is best to start at the lowest possible dose and titrate up slowly to an effective dose while monitoring for side effects and potential drug interactions. If the patient has not shown signs of improvement after four weeks on a therapeutic dose it is likely that medication will not be effective in controlling symptoms and another treatment plan should be undertaken. It is always reasonable to get a geriatric psychiatry or geriatrician consult if there are questions about response to treatment. Older adults may be interested in alternative therapies for the treatment of depression. Unfortunately, there has been little convincing evidence to support this type of treatment so far. In particular, vitamin B12 supplementation has been investigated in multiple studies and while it can produce significant hematologic and metabolic benefits in deficiency, it does not appear to change cognitive or psychiatric variables [63, 64]. There is some research evidence to suggest that St. John's Wort may be helpful for some patients with milder forms of depression [65], but it probably should not be used for those with moderate to severe conditions given the limited evidence for efficacy as well as its potential for drug interactions [66]. Patients with severely disabling or treatment-refractory major depression should be referred for evaluation for electroconvulsive therapy, for which considerable evidence supports its efficacy [67], or treatments being investigated in selected patients such as repetitive transcranial magnetic stimulation [68], magnetic stimulation therapy [69], or deep brain stimulation [70].

Older adults may also express interest in non-medication therapies for depression. Increasing social interactions or increasing the perception of social supports may impact depressive symptoms in older adults [71]. A therapist should focus on enhancing social supports, resolving interpersonal stressors, and increasing coping abilities. Cognitive behavioral therapy (CBT) is the most commonly studied psychotherapeutic modality studied in older adults and it has been shown to be effective in treating depression [62]. Other acceptable types of psychotherapy include interpersonal therapy, psychodynamic therapy, and eclectic therapy [62]. In general, while non-therapeutic treatment modalities avoid side effects and interactions associated with medication, there is a slower response with psychotherapy compared to medication and potentially greater barriers to obtaining care. Financial burden, transportation barriers, and a lack of therapists trained to work with older adults are all potential obstacles to obtaining care [62]. Finally, it is important to consider that up to 30 % of older adults being treated for depression are undertreated—in other words, they continue to meet criteria for depression despite intervention [72]. When faced with this situation, primary care providers should consider any of the following to intensify treatment:

increasing antidepressant dose, adding a second antidepressant, increasing frequency or length of therapy sessions, changing to a new treatment modality, or referral to a geriatric specialist [72].

Conclusion

The syndromes of delirium, dementia, and depression exist on a continuum with overlap that can blur the distinguishing lines of diagnosis. They highlight many problems faced by older adults in the primary care setting. The primary care provider is in a unique position to diagnose and address these issues with their patients and caregivers. Central to all of these problems are the notions of diligent observation for detection and initiation of treatment. It is imperative that patients and families understand that treatments are available and can make a difference in functioning and quality of life. Furthermore, treatment interventions may require interdisciplinary support teams of psychiatrists, geriatric specialists, social workers, and therapists to help build resources to keep patients and families optimally supported without overwhelming the resources of the primary care provider's office. There continues to be a need for quality research investigating mental health issues in older adults as this segment of the population continues to grow.

Conflict of Interest Lisa J. Downing declares that she has no conflict of interest.

Thomas V. Caprio declares that he has no conflict of interest.

Jeffrey M. Lyness declares that he has no conflict of interest.

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