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Cognitive Function, Aging, and Ethical Decisions: Recognizing Change

Janet A. Yellowitz, DMD, MPH

Department of Health Promotion and Policy, Baltimore College of Dental Surgery, University of Maryland, 666 West Baltimore Street, Room 3E02, Baltimore, MD 21201, USA

As the population ages, dental and other health care providers will be working with more older adults (and their family members) with changing cognitive status than ever before in history. The intent of this article is to review common cognitive changes in older adults that will undoubtedly be seen in dental practices. Knowledge of the common signs and symptoms of age-related cognitive changes provides a basis on which to identify individuals with undiagnosed cognitive changes. This article reviews the relationship between cognitive function, aging, and dementia (specifically, mild cognitive impairment and Alzheimer's disease), the role of the dental team in recognizing these conditions, and issues related to obtaining informed consent from cognitively impaired patients.

Older adults often are identified as the most physically and psychologically heterogeneous adult cohort. Although all organ systems demonstrate some decline with increasing age, each system "ages" at a different rate. Older adults exhibit a wide array of cognitive abilities, ranging from functioning similar to that of younger people to mild impairment to clinical dementia [1,2]. One of the hallmarks of aging is a progressive loss of function, with functionally disabling cognitive declines generally indicating the presence of disease. Because of their enormous impact on individuals, families, the health care system, and society as a whole, cognitive impairments present a major health problem in the United States.

Identifying cognitive abilities can be challenging when working with individuals who have a lifetime of experience and are competent to make decisions [3], particularly because individuals with dementia present with a range of impairments, depending on the disease stage and cause, and a range of abilities (some preserved, some impaired). An increasingly important part of the health care of older adults is identifying their

E-mail address: jay001@dental.umaryland.edu

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decision-making capacity and preferences for health care. Providing health care to cognitively impaired persons presents a range of ethical dilemmas, with competence a crucial concern. Research into the decision-making competence of cognitively impaired elderly persons is a growing field that is beginning to yield findings with practical implications for preserving the autonomy and welfare of this group of vulnerable patients [4].

The following scenarios are real-life dental office experiences. They are presented as opportunities to identify patients' cognitive changes. Is it possible that these events could occur in your practice? Are you prepared to recognize cognitive changes in older adults?

1. You have just presented a $6000 treatment plan to your patient, a 74-year-old retired college professor. The patient has received extensive dental care throughout his lifetime and has always been prompt for appointments. Although his wife usually accompanies him, she is not with him today, and he says this is because she is not feeling well. Recently, he missed a couple of appointments, despite having been reminded by telephone the previous day. Following a comprehensive examination, you review the treatment plan and its rationale with the patient to obtain consent and authorization for payment. After asking a few questions about using his credit card for payment and the length of time needed to complete the treatment, the patient consents to the care and signs the authorization for payment with his credit card. A series of appointments are scheduled and the patient leaves. Later that day you receive a frantic telephone call from the patient's wife, seeking an explanation for the $6000 credit card charge for her husband's "teeth cleaning"—or, at least, that is what her husband told her he received at your office. When asked why the bill is so high, he claims to be unsure but suggests that it was a mistake and there is no need to worry about it.
2. While waiting to talk with the dentist following a routine visit with the dental hygienist, a 67-year-old female patient talks about how proud she is of her three grandchildren. The practice and the dental hygienist have known the patient for many years. Early in the appointment, the hygienist noticed that the patient appeared out of sorts and distracted. When questioned, the patient said that it was nothing; she had just been rushing around and was almost late for the appointment. The hygienist becomes even more concerned about the patient when she is unable correctly to name her three grandchildren, who live down the street from her. Instead of naming her grandchildren, the patient identifies her two children and says the name of the third is on the "tip of her tongue." They laugh, and the hygienist says that she understands: things like this happen all the time. After the appointment, the dental hygienist again asks the patient whether she remembers the name of her third grandchild. The patient appears a bit confused by the question; she then identifies two grandchildren but still cannot remember the third name.

3. You are asked to see an emergency patient by a colleague. The patient is an 85-year-old gentleman complaining of chronic left-sided facial pain. He is unsure how long the pain has been present; however, it is fairly uncomfortable at the moment. The patient is married but has come to the appointment alone. The patient presents a list of 13 medications but is unclear about when or why he takes them. The clinician recommends that the patient keep cold compresses on his face for 20 minutes every hour and return the following day with his medication bottles and his wife. The dentist is unsure the patient will remember the instructions and is unsure how to proceed.

These cases exemplify some of the intricacies of identifying possible cognitive changes in older adult patients. Have you experienced one of these situations or something similar? Are these patients demented, delirious, or "just old"? To help reduce the chances that these or similar situations will occur, this article provides dentists with information to improve their skills in detecting cognitive changes in their patients. The last section of the article provides a list of suggestions for avoiding and/or managing these situations.

Memory and aging: is it normal to lose cognitive function with age?

People have always lived to extreme old age without severe memory loss, although memory loss has been attributed to the aging process [5]. Changes in brain structure and function are inevitable age-related events. For example, some neurons shrink, neurofibrillary tangles develop, and beta-amyloid plaques develop around neurons. In addition, there is free radical damage and an increase in inflammation. Although these events are ongoing, longitudinal studies have demonstrated that many, if not most, older adults maintain their cognitive function throughout their lifetimes.

Memory changes are the most common cognitive complaints reported by older adults. Yet many memory processes do not appear to change with successful aging, and an older adult's memory is typically adequate for the demands of independent living. Remote memory (recall of events that occurred in the distant past), sensory memory, and semantic memory (ie, vocabulary and general information about the world) remain largely unchanged in older adults. Verbal abilities also remain stable with normal aging. In contrast, nonverbal creative thinking and new problem-solving strategies show a slow decline with age [6].

Many factors influence memory and cognitive ability in older adults. Relevance and time of day influence functional abilities. Hess et al [7] found that older adults' memory and decision accuracy improve when they perceive the task to be personally relevant or are held accountable for their performances. Others have found that when older adults are given materials that engage their emotional interest, their performance on memory tests equals that of young adults [8]. Time of day also has been identified as

a factor in memory, with older adults performing better at their optimal time of day on most memory tasks. This time is determined by a biologic clock that appears to shift toward the morning as a person ages [9].

Horn and Cattell [10] suggest that crystallized abilities (information and skills gained from experience) remain relatively intact with aging, whereas fluid intelligence, which involves flexible reasoning and problem solving, declines. Attention, namely the ability to focus on one or more pieces of visual or auditory information long enough to register and make meaningful use of the data, does not change with aging. However, one's attention can be altered by perceptual or sensory changes, illness, chronic pain, medications, and psychologic disturbance (in particular, depression and anxiety)—all common in older adult populations.

The most common reasons for acute confusional states in elderly patients are adverse drug events and drug interactions. Medications are the most common cause of acutely reversible cognitive impairment, which is often due to declines in homeostatic processes, such as drug absorption, distribution, metabolism, and excretion change [11]. Drug absorption and metabolism are further affected by age-associated decreases in stomach acidity, splanchnic blood flow, peristalsis, and stomach emptying time.

Because of the presence of comorbid medical conditions, the use of medications taken for central nervous system effects (eg, benzodiazepines, neuroleptics, antihistamines) and the use of over-the-counter medications make it crucial for health care providers to review all medications with patients before prescribing additional ones, and when the provider is suspicious of a cognitive change. Other significant common causes of dementia in the elderly are dehydration, fluid or electrolyte derangement, pain, and infection.

Cognitive impairments and aging—what is dementia?

Dementia is a generic term used to designate chronically progressive brain disease that impairs intellect and behavior to the point where customary activities of daily living become compromised [12]. The word comes from two Latin words that translate as "away" and "mind." It is not the name of a specific disease but rather a description of a clinical state and does not imply causation or prognosis.

Dementia is a global impairment of the intellect, memory, and personality without alteration of consciousness. It has been characterized as acting confused, talking or mumbling to oneself, repeating the same thing over and over, hearing or seeing things that are not there, forgetting the names of family members or close friends, forgetting the right words to use, yelling or swearing at people, interfering or offering unwanted advice, acting restless or agitated, acting fearful without good reason, complaining or criticizing, showing inappropriate sexual behavior, wandering outside the house, and refusing to be left alone.

In the past, dementia was designated by many names, including hardening of the arteries, senility, and organic brain syndrome. Dementia, as described by the American Psychiatric Association in its *Diagnostic and Statistical Manual of Mental Disorders* [13], is the development of multiple cognitive deficits that include memory impairment and at least one of the following:

- Aphasia (deterioration of language function)
- Apraxia (impaired ability to execute motor activities, despite intact motor abilities, sensory function, and comprehension of the task)
- Agnosia (failure to recognize or identify objects despite sensory function)
- Disturbance in executive functioning (ie, ability to think in abstractions and to plan, initiate, sequence, monitor, and stop complex behavior)

In addition, the cognitive deficits must be sufficiently severe to cause impairment in occupational or social functioning, such as working, shopping, dressing, bathing, or handling finances, and they must represent a decline from a previous level of functioning [13]. As the disease progresses, those with dementia become impaired in their ability to learn new material and forget previously learned material. Victims may lose valuables like wallets and keys, forget food cooking on the stove, or become lost in familiar neighborhoods.

Persons with dementia exhibit numerous specific changes in cognitive performance. The abilities commonly affected in dementia include verbal and nonverbal memory, perceptual-organizational abilities, communication skills, and psychomotor performance. The early signs of dementia often are subtle and can easily be passed off as a normal reaction to emotional upset or other physical ailments. Short-term memory loss is usually the first recognizable sign of a developing problem. Although the person is able to reminisce about significant past events in great detail, he or she may start to forget the names of close friends and family, miss appointments, or repeat certain tasks over and over. Balancing a checkbook or counting change can become problematic. The individual may become confused and restless. Often people with dementia experience disorientation to time and place, or they may start to withdraw from the daily activities of life and show a general apathy marked by unusual outbursts of aggressiveness, hypersexuality, and irritability.

Many reversible and irreversible conditions can mimic dementia in older adults, making the prognosis of dementia dependent on the underlying cause. Alzheimer's disease is the most common cause of dementia in older adults, but cognitive deficits may have many causes, including degenerative central nervous system conditions that cause progressive deficits in memory or cognition (eg, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis or multiple sclerosis), systemic conditions (eg, hypothyroidism, vitamin B12 deficiency, HIV infection), structural brain damage

(hemorrhagic or occlusive cerebrovascular disease, normal pressure hydrocephalus, meningioma or subdural hematoma), and substance abuse (eg, alcohol). Infections such as cerebral, fungal, and parasitic infections and tertiary stage syphilis (usually 15 to 30 years after acute exposure) can mimic dementia. As many as two thirds of individuals with AIDS have AIDS-related cognitive changes, but these changes are the sole presenting symptom in less than 10% of HIV-infected individuals. In many patients with dementia, no underlying cause is identified.

Wide variation is seen from person to person in rates of decline and in the rapidity with which the dementing process progresses [14]. The nature, extent, and rate of decline depend on the underlying cause, the person's educational level, and the person's general health status. Depending on the type and stage of disease, individuals with dementia may [13]

- Exhibit little or no awareness of memory loss or other cognitive abnormalities
- Be spatially disoriented and have difficulty with spatial tasks
- Make unrealistic assessments of their abilities and make plans that are not congruent with their deficits and prognosis (eg, accepting an expensive treatment plan when indigent)
- Underestimate the risks involved in activities (eg, driving)
- Exhibit violent behavior
- Attempt suicide, particularly at early stages when the individual is more capable of carrying out a plan of action
- Have disturbances in their gait, leading to falls
- Show disinhibited behavior, such as making inappropriate jokes or comments, neglecting personal hygiene, exhibiting undue familiarity with strangers, or disregarding conventional rules of social conduct
- Have delusions, especially ones involving themes of persecution (eg, the belief that misplaced possessions have been stolen)
- Be vulnerable to physical stressors (eg, illness or minor surgery) and psychosocial stressors (eg, going to the dental office or hospital or through bereavement)

Prospective studies of subjects with clinically evident dementia show that subtle symptoms often occur many years before the dementia can be diagnosed.

Early in the disease process, there often is a growing awareness that something is wrong. Both the person with dementia and those closest to them may be aware of the changes and concerned about how best to address memory lapses, functional impairments, or periods of confusion. Because dementia-like behaviors can have a large number of reversible causes, it is crucial to identify the cause of the behavior as soon as possible. Unrecognized cognitive impairments may lead to iatrogenic illness, unnecessary work-ups driven by vague symptoms, inappropriate and costly use of health care, and poor outcomes. Early and accurate diagnosis of these

conditions gives patients a greater chance to benefit from existing treatments and allows them and their families to plan for the future. Because this early phase may last for years, it is important for family and caregivers to monitor the individual's behavior over time.

Recognizing cognitive changes in older adults: the role of oral health professionals

Assessing cognitive changes in older adults can be challenging to the professional, because they often retain their social skills and ability to make customary social remarks longer than their insight and judgment. Patients may sound fine and appear to respond appropriately but in fact be unable to care for themselves responsibly. Clinicians usually assess cognitive skills intuitively; however, retaining a patient's informal personal information (eg, names of children and grandchildren, hobbies) can be a useful aide in reviewing the patient's memory and checking for cognitive changes. When suspicious, the clinician may ask the patient to describe a typical day, to describe how he or she spends leisure time, or, when applicable, to identify the names of his or her children or grandchildren. These tasks require recall of categories of activities and abstract thinking, which are cognitive abilities that decline early in dementia. The responses must then be corroborated with the patient's caregiver or others knowledgeable of the specific information requested. Like anyone with symptoms of a disease, people with dementia have good days and bad days. Mace et al [15] compared a demented individual's tendency to be able to do something one day and not the next to a loose light bulb that sometimes connects and sometimes fails to connect.

Health care professionals and caregivers often mistake early signs and symptoms of dementia for normal aging changes, thereby perpetuating myths and fallacies about aging and dementia—in particular, the notions that the early signs of dementia are "just old age" or "just senility" or are due to chronic illness. Because early signs and symptoms of dementia are often subtle and nonspecific, clinicians may overlook apparently healthy adults with cognitive impairments [16]. During an office visit, cognitively impaired patients may appear to present appropriately, especially when limited time is spent observing or conversing with them. Dental practitioners may notice memory lapses, missed appointments, symptomatic complaints discordant with clinical evaluation, hearing acuity problems, or deference to a spouse or caregiver in responding to questions, making expensive purchases, or agreeing to an extensive treatment plan.

The low rates of recognition of dementia among health care professionals constitute a major barrier to appropriate care for these patients [17]. Rates of "failure to recognize" have been reported as high as 97% for mild dementia and 50% for moderate dementia [18]. Often these impairments are not recognized until the cognitive loss has become severe. As in the case of

other chronic and debilitating diseases, such as cancer and diabetes, the presence of cognitive decline in the dental practice affects the delivery of care. Dental professionals need to be aware of the impact of aging and disease when a patient presents with subtle changes in his or her mental status. Dental care providers are responsible for identifying patients' signs and symptoms of disease to recognize and prevent problems associated with their management and for using consultations and referrals appropriately [19]. It is important for dental professionals to screen and assess the cognitive abilities of older adults and to ensure acceptance of proposed treatment options before proceeding with treatment.

Once patients have been identified as having a problem with memory or with the ability to think clearly, the dental team needs to follow up on these concerns with the patient and his or her caregiver or family member. The dental team can help ensure that the individual and family have a realistic understanding of the illness and its impact on the individual's general and oral health. Likewise, the dental team is responsible for identifying a realistic treatment plan for the individual, taking into account the potential impact of the disease on the individual's oral health behaviors. The dental office may also assist the family in identifying local resources and referrals.

Following a diagnosis of dementia, noticeable changes in mental functioning may be noted in both the diagnosed individual and the caregiver. These reactions include depression, denial, anxiety and fear, isolation and loneliness, embarrassment, shame, and feelings of loss. As the disease progresses, individuals with dementia may experience difficulty performing daily routines, as well as frustration due to their need for assistance with activities of daily living and self-care. Hence the dental team may want to reinforce the need for increased frequency of personal and professional oral health maintenance and routine care.

When dealing with people with dementia and their caregivers, health care professionals should acknowledge their feelings and encourage them to take care of their physical and mental health. Caregivers need to be supported in maximizing their caregiving roles while maintaining an appropriate balance in their personal life. Family roles change as the caregiving system is organized and caregivers take greater control over the impaired elder's life. As dementia progresses, the individual can change from a competent, independent adult into a person who requires help with all activities of daily living.

Mild cognitive impairment

The term ''benign senescent forgetfulness'' was introduced in 1962 to distinguish individuals with mild, minimally progressive cognitive impairment from those with more malignant progressive dementia [20,21]. In 1990, ''mild cognitive impairment'' (MCI) was first used to describe individuals with cognitive impairment on neuropsychologic testing who do not meet criteria for dementia and whose impairment is not the result of a known

medical condition [22–24]. MCI has also been referred to as age-associated memory impairment and has been identified as a likely early clinical manifestation of Alzheimer's disease [25].

MCI is a clinical entity characterized by recent memory loss greater than expected with normal aging, without significant dysfunction in other cognitive domains or impairment in day-to-day functions (activities of daily living) [26]. Individuals with MCI may present with disturbances in any of the following cognitive functions [13]:

- Memory (learning or recalling new information)
- Executive function (planning, reasoning)
- Attention or speed of information processing (concentration, rapidity of assimilating or analyzing information)
- Perceptual motor abilities (integrating visual, tactile, or auditory information with motor activities)
- Language (eg, word-finding difficulties, reduced fluency)

Although the specifics of MCI are not well defined, there is conceptual agreement that MCI describes older people whose memory or other cognitive abilities are not at the same level as when they were younger. The early cognitive deficits of MCI are usually not significant enough to interfere markedly with daily cognitive and functional activities. The diagnosis of MCI is difficult, because it is dependent on cognitive performance tests, which are subject to practice effects and random variability [5,23,27], as well as on the testing of logical memory, visual reproductions, cognitive flexibility, and other factors [28].

The reported prevalence of MCI varies widely and is dependent on the criteria used. Data on the incidence of MCI are limited, with most published studies having participants from clinics that specialize in memory problems or too few subjects to draw definitive conclusions [5]. The Indianapolis Health and Aging Study reported an overall prevalence of approximately 25% for cognitive impairment without dementia among older persons and found that the incidence of MCI increased with age [29]. The Canadian Health and Aging Study reported 15% of older people as having MCI [28,30] and found that 10% to 15% of patients with MCI converted to dementia each year, totaling 48% in 4 years.

Lyketsos et al [31] found that, like most people with dementia, 43% of those diagnosed with MCI experience neuropsychiatric symptoms, such as depression, apathy, and irritability. In addition, following a diagnosis of MCI, victims often demonstrate a decline on measures of activities of daily living, such as managing financial affairs [32]. MCI victims are two to three times more likely to be placed in a long-term care facility [2,33] and twice as likely to die over the next several years than people without cognitive impairment [33,34].

Longitudinal research suggests that 80% of those diagnosed with MCI will go on to develop Alzheimer's disease within 5 to 8 years, converting at

a rate of approximately 10% to 15% per year, as compared with 1% to 2% in the general population [28]. Overall, the risk of Alzheimer's disease appears to be increased between three and eightfold [23,33]. Given the risk of MCI's conversion to dementia, it needs to be identified and treated early, increasing the responsibility of the dental team to identify suspicious findings and to refer patients for comprehensive evaluation.

Alzheimer's disease defined

Alzheimer's disease (AD), or dementia of the Alzheimer's type, the single most common cause of dementia, is an irreversible, chronic disorder with a gradual onset and a slowly progressive course that is characterized by an inevitable deterioration in cognitive function [35]. Although memory loss is a feature of all dementias, the cardinal feature of AD is a progressive loss of memory of recent events and experiences. AD affects every individual differently, and there is no way to determine precisely how the disease will present and progress. Although the disease has no cure, some of its symptoms can be treated with medications and behavioral approaches.

AD was first described by Alois Alzheimer in 1906. The pathognomonic beta amyloid extracellular neuritic plaques and intracellular neurofibrillary tangles, which Alzheimer first observed, continue to be necessary for postmortem confirmation [14]. It is believed that the clinical symptoms of AD are preceded by a period of unknown duration (years to decades) during which neuropathologic alterations accumulate in the AD brain without detectable changes in cognition [14,25].

The greatest risk factor for AD is increasing age (generally $\geq$60 years), although it has been found in much younger individuals. Excluding persons with clinically questionable dementia, AD has a prevalence of approximately 1% among those aged 65 to 69 years, which increases to 40% to 50% among persons aged 95 years and older [36,37]. In 2003, 4.5 million Americans were estimated to have AD, twice as many as in 1980 [38]. As the population ages, the disease affects a greater percentage of Americans. Assuming that the number of older adults continues to increase without advances in the prevention or treatment of AD, the number of individuals with AD is expected to grow by 25% over the next 20 years and will range from 11.3 million to 16 million in 2050 [38].

AD constitutes about two thirds of cases of dementia overall (various studies range from 42% to 81%), with vascular causes and other neurodegenerative diseases, such as Pick's disease and diffuse Lewy body dementia, making up most of the remaining cases [36,39]. The prevalence of AD is increased in individuals with Down's syndrome and in individuals with a history of head trauma [13].

Because of cognitive reserve and the subtlety of the pathologic changes, it is difficult to date the onset of the dementia. This reserve may help explain why certain factors (ie, higher education, maintenance of active brain

activity) [40] are negative risk factors for the condition. As damage evolves, the reserve is exhausted and the beginnings of impairment become evident. Unfortunately, the clinical diagnosis typically is not made until significant damage has occurred. The overwhelming majority of AD cases are sporadic and nonfamilial and thus are not related to specific genetic mutations.

Dementia is democratic—it knows no social, racial, gender, or economic lines. Typically, memory complaints appear first, although behavioral changes, such as social withdrawal and clustering of affective symptoms, can be the first indications of an important change in the individual's cognitive state [41]. Problems with judgment, problem solving, executive function, planning, and abstract thought are also common in early AD. Behavioral symptoms (noncognitive) are an important but often neglected problem in AD. They create more stress on caregivers than does the cognitive dysfunction itself [42]. Personality changes may range from progressive passivity to marked hostility and can develop before the cognitive impairments. Patients can show decreased emotional expression, increased stubbornness, diminished initiative, and greater suspiciousness [43]. These behavioral changes may be noted in the dental office in an individual presenting with new or worsened procrastination, poor planning, impaired problem solving, or difficulty in handling paperwork (completing health history forms, writing checks, or completing insurance documents).

AD tends to present with an insidious onset, with early deficits in recent memory followed by the development of aphasia, apraxia, and agnosia after several years. In later stages, individuals may develop gait and motor disturbances and eventually may become mute and bedridden. The usual progression of decline is from higher levels of intellectual activities, such as money management, shopping, cooking, reading, and driving, to lower-level activities, such as personal hygiene. Dementia affects the ability to carry out the requisite tasks and contributes to functional decline. Independent living requires the accomplishment of both activities of daily living (ADL), which include self-care tasks such as bathing, grooming, and toileting, and instrumental activities of daily living (IADL), which are cognitively more complex activities such as driving and meal preparation [21–25]. The severity of disease progression in dementia can be demonstrated by performance decline on IADL and ADL tasks. IADL performance decline has been associated with 1-year risk of incident dementia [44].

The average duration from onset of symptoms to death is 8 to 10 years. From the time of diagnosis, people with AD survive about half as long as those of similar age without dementia. Average survival time is affected by age at diagnosis and severity of other medical conditions [45].

Patients with AD come to medical attention because of forgetfulness, usually accompanied by apathy. Apathy, or the lack of motivation or behavioral initiation, is a pervasive problem throughout the course of AD and is perhaps the most common adverse behavior in the illness. Apathetic behaviors are often misattributed to insensitivity, disinterest, and voluntary

Box 1. Modification of the Alzheimer's Association's 10 Warning Signs, including examples that may be observed by an oral health care provider or staff members

Memory loss

Forgetting recently learned information is one of the most common early signs of dementia. Although it is normal to forget appointments, names, or telephone numbers, those with dementia forget these things more often and do not remember them later. Patients with memory loss may

- Be more repetitive; ask the same thing over and over, for example, ''Are you almost done? Are you almost done? Are you almost done?''
- Forget recent conversations, names, telephone numbers, events, and appointments; misplace objects; come to an appointment at the wrong time or date
- Be poor historians—when unsure, they will ''make up'' an answer
- Have difficulty discussing current events in an area of interest
- Be unable to remember forgotten thoughts at a later date
- Appear more passive and less responsive; be more irritable and suspicious than usual; misinterpret visual or auditory stimuli
- Repeatedly and apparently unintentionally fail to follow directions; for example, be unable to locate the restroom, even though directions have been provided several times in the past 10 minutes

Difficulty performing familiar tasks—managing routine chores

- Patients may have trouble following a train of thought or performing tasks that require multiple steps, such as following directions to modify a current toothbrush regimen.
- Patients may forget medications or have difficulty taking medications according to instructions.
- Patients may have unexplained weight loss or gain.
- Patients may have difficulty adapting to stressful experiences (eg, death or illness of a spouse, being hospitalized).

Problems with language—word-finding difficulty

Patients may have difficulty finding the words to express what they want to say; for example, when unable to find the toothbrush, patient may ask for ''that thing for my mouth.''

Disorientation to time and place

It is normal to forget the day of the week or where you are going, but only temporarily. These patients may

- Get lost on their own street or within the confines of a familiar setting
- Organize objects around the house, finding their way around familiar places
- Forget where they are, how they got there, and how to return home

Poor or decreased judgment

No one has perfect judgment all the time. However, these patients may exhibit

- Impaired reasoning ability; inability to respond with a reasonable plan to problems, such as what to do if a fire occurs
- Uncharacteristic disregard for rules of social conduct—for example, loud and negative comments about another person
- Inappropriate clothing and inattention to appearance; difficulty dressing for the weather; may wear several shirts or blouses on a warm day, very little clothing in cold weather, or soiled clothing
- Tendency to give away large amounts of money or pay for unnecessary services

Problems with abstract thinking

Patients may have difficulty writing a check or balancing a checkbook; they may forget what the numbers are and what needs to be done with them.

Misplacing things

Anyone can temporarily misplace a wallet or keys. These patients may put things in unusual places, for example, eyeglasses in the freezer, a wristwatch in the sugar bowl, or a toothbrush in a shoe.

Changes in mood or behavior

Everyone can become sad or moody from time to time. These patients may

- Appear more passive and less responsive; appear uninterested in surroundings
- Show rapid mood swings—from calm to tears to anger—for no apparent reason
- Misinterpret visual or auditory stimuli—for example, be frightened by the sound of a high speed handpiece or want to answer the telephone in your office

Changes in personality

- Patients may become extremely confused, suspicious, fearful, or dependent.

- Patients may defer to a caregiver to answer questions directed to them.

Loss of initiative

- Patients may appear unable to adapt to a new environment, for example, to a new or different office.
- Patients may experience functional difficulties under stress; for example, pain, an emergency, or death or illness of a spouse may precipitate a ''bladder accident.''
- Patients may become very passive, not wanting to do their usual activities; they may sleep more than usual.

or willful refusal to cooperate on the part of the patient [46]. Misplacing personal objects, repeating questions, and forgetting recent events are among the presenting symptoms. Although the patient may forget people's names, word-finding during conversation is usually not a major problem [12]. In the early stages, passivity and withdrawal are seen in up to two thirds of patients with mild AD [47]. Passive personality change has been identified as predating cognitive abnormality but is only discerned retrospectively. One retrospective review suggested that social withdrawal, mood changes, or depression were present in more than 70% of cases, with a mean duration of more than 2 years before diagnosis of AD [41]. Many with AD do not recognize that they are impaired, an attitude that has been linked to the difficulty in implicit learning of intellectual limitations, rather than to a ''denial'' of their illness [48].

The recommended criteria for diagnosing AD include

- Insidious onset
- Progressive course
- Memory loss
- At least one other focal cognitive disturbance, such as language dysfunction, apraxia, or executive dysfunction

These impairments should represent a decline from past levels of performance and interfere with established patterns of daily function. Motor functions generally remain normal.

The diagnosis of AD is based largely on clinical findings and can be made only when other causes for the dementia have been excluded. In most AD cases, CT or MRI will reveal brain atrophy, with wider cortical sulci and larger cerebral ventricles than would be expected in the normal aging process. The diagnosis of AD is confirmed only with a postmortem microscopic examination of the brain, which will reveal histopathologic changes, including senile plaques, neurofibrillary tangles, granulovascular degeneration, neuronal loss, and amyloid angiopathy. Minor pathologic

changes may appear decades before clinical symptoms occur, and they may also be found in middle-aged and elderly persons without obvious symptoms of the disorder [35].

Individuals with undiagnosed dementia may exhibit behaviors or symptoms that offer a clue to the presence of dementia and can be observed by the dental team. If the individual has increased difficulty with any of the activities listed in the next paragraph, he or she should be referred for a comprehensive assessment to rule out possible causes of disease.

The following list is the Alzheimer's Association 10 Warning Signs. See Box 1 for examples of items on this list that may be observed by an oral health care provider or staff members [49].

Memory loss
Difficulty performing familiar tasks—managing routine chores
Problems with language—word-finding difficulty
Disorientation to time and place
Poor or decreased judgment
Problems with abstract thinking
Misplacing things
Changes in mood or behavior
Changes in personality
Loss of initiative

Once they have identified a patient who has problems with memory or the ability to think clearly, clinicians need to follow up on these concerns with the patient's caregiver or family member. When discussing observations of a patient's cognitive changes with family members, they should emphasize that they have identified a change in behavior and that they are not diagnosing a disease but are suggesting the need for a comprehensive evaluation to identify the cause of this change.

Informed consent: working with the cognitively impaired

Providing oral health care for cognitively impaired older persons presents a range of ethical dilemmas, some of which are addressed in the American Dental Association's (ADA) Principles of Ethics and Code of Professional Conduct. The ADA's Principles of Ethics states that dentists have several affirmative duties toward patients. The ethical principle of beneficence included in the code means that professionals have a duty to act for the benefit of others, "with due consideration being given to the needs, desires and values of the patient." In addition, the principle of autonomy guides dentists in working with impaired patients. This principle states that professionals have a duty to treat the patient according to the patient's desires, within the bounds of accepted treatment, and to protect the patient's confidentiality. Patients with the capacity to make health care decisions should have the right to make decisions about their own bodies, whether or

not those decisions are approved by their physicians and families. Because of the impact on treatment planning and overall care, it is important to identify patients' cognitive impairments before obtaining consent and initiating treatment. Unless patients give evidence to the contrary, they are generally presumed capable of deciding about treatment.

Discerning a patient's capacity to consent to treatment can be one of the most challenging aspects of the consent process, given that the ability of patients to make informed decisions can be compromised by illness, medication, or cognitive impairments and that a loss of decision-making capacity (or competency) is an inevitable consequence of dementia. Ensuring that an appropriate consent has been given can be particularly difficult when a patient demonstrates behaviors that reflect a cognitive change but has not been diagnosed with a cognitive impairment. When they are concerned about an individual's decision-making ability, whether because the individual has undergone an abrupt change in mental status, has refused recommended treatment, has consented too hastily to treatment, or is suspicious in other ways for cognitive impairment [50], health care providers should consult with the individual's caregiver, spouse, family member, or primary care physician to discuss his or her decision-making capacity and should refer for evaluation as necessary [51], keeping in mind that these individuals may not be aware of or willing to acknowledge cognitive changes. In general, a physician's confirmation of a patient's cognitive abilities is best following a comprehensive assessment of the patient.

The process of informed consent is the primary mechanism for protecting patient autonomy in treatment decisions [52] and is essential to the delivery of clinical care. The standard for legally competent understanding assumes that the individual can comprehend diagnostic and treatment information. In general, for the informed consent to be valid [53], (1) the patient must be informed; (2) the patient must have free choice; and (3) the patient must have the capacity to consent to treatment.

Although legal standards vary by jurisdiction, four specific abilities need to be addressed when assessing a patient's decision-making capacity, including

The ability to understand information about treatment
The ability to appreciate how that information applies to one's own situation
The ability to reason with that information
The ability to make a choice and express it [50,51]

Based on this information, the practitioner will be better able to evaluate the patient's competency. Assessments of the patient's understanding of treatment options should focus on a specific choice, whereas assessment of the patient's appreciation of the meaning of diagnostic and treatment information should focus on whether the patient can describe the

implications of the treatment options [54]. Although they are not addressing the legal concerns of informed consent, practitioners who are developing a treatment plan for a cognitively impaired patient without advance directives may try to identify the patient's prior choice while competent or attempt to identify his or her best interest, in lieu of waiting for a guardianship to be established [55].

Feinberg and others have found that persons with dementia possess sufficient capacity to state specific preferences, make care-related decisions [54,56,57], and be involved in decisions about daily living [55]. Because adults with mild dementia often participate in medical decision making as defined by legal standards, health care professionals need to ensure that these individuals are able to act independently. Most health care providers assess their patients' decision-making capacity within the health care system, but evaluations of decisional capacity made on the basis of a clinical interview are often unreliable [54,58].

Advance health care directives: living wills, health care proxies, power of attorney

Before they become incapacitated to make health care decisions, individuals are advised to prepare documents that direct the provision of their health care when they are no longer able to do so. These documents help health care providers to manage the individual's care as he or she had desired and do not require a consensus answer. To complete these documents, individuals must be 18 years of age and of sound mind; depending on the state, the documents may need to be signed by a witness or notary public. Although all states recognize advance health care directives, each state has its own laws regarding these documents. The first document is a written statement or declaration that details the type of care desired (or not desired) and requires health care personnel to follow these directions. The second document, called a "durable power of attorney for health care," appoints someone to be an individual's health care agent or proxy. In some states, these documents are combined into a single form. Health care directives are also referred to as advance directives, medical directives, directives to physicians, declaration directives, declarations regarding health care, designations of health care surrogate, patient advocate designations, and living wills.

When enacted, the health care proxy grants authority to a second person to make health care decisions for a first person when he or she is unable to express a preference. Generally, this occurs when individuals are unconscious or no longer have the legal capacity to make their own decisions. Physicians are responsible for making the determination regarding an individual's capacity to make his or her own medical treatment decisions, and each state has its own rules and regulations regarding their format and use.

Depending on state law, living wills permit individuals to express their desire to be given life-sustaining treatments in the event of terminal illness or injury and provide other medical directions that affect the end of life. Living wills are thus rarely applicable to the dental environment, but having this information available can be considered good practice on the part of a dental practitioner. In all states, physicians (usually two) determine whether an individual's medical condition warrants the use of a living will.

To say that individuals lack capacity usually means that they cannot understand the nature and consequences of the health care choices presented to them and that they are unable to communicate their own wishes for care, either orally, in writing, or through gestures. Through the use of advance directives, some patients will have their health care concerns addressed before becoming incapacitated. It is crucial for the dental professional to review the documents and verify the extent of the care before initiating treatment.

Clinical judgments about consent capacity are challenging and at times unreliable, especially in older adults who have neurologic conditions with subtle cognitive changes. No standardized instruments to assess competency currently exist, and until a valid and reliable method is devised for this purpose, it behooves clinicians to take whatever measures necessary to ensure the accuracy of their assessment of their patients' cognitive skills.

Summary

With the incidence and prevalence of all dementias increasing along with the longevity and age of the population, the early identification of these ailments is crucial to reducing their associated morbidity and mortality. However, the assessment of cognitive impairments in older adults is complicated by the loss of physiologic reserve, the presence of multiple and chronic diseases, polypharmacy, and the attitude of health care professionals. Although "determining the capacity to make decisions is an inexact science," Wetle [59] suggests that more knowledge and a higher level of suspicion will enable dental professionals better to identify and refer individuals with suspicious cognitive changes. Advances in diagnostic testing and the trend toward earlier diagnosis give health care professionals a greater opportunity for early and consistent involvement in everyday care decisions regarding the person with a cognitive impairment.

Addressing the scenarios: helpful hints and suggestions

Addressing the problems posed at the beginning of this article in an appropriate manner may require spending additional time with each patient. Although many practitioners prefer not to know the personal sides of their patients, one member of the team might be designated to inquire about the patient's life and lifestyle.

Having a dental team familiar with the signs and symptoms of common cognitive changes in older adults reduces the risk of not recognizing patients with cognitive changes. Staff members need to be knowledgeable and empowered to address these concerns with the dentist.

The following is a list of ways in which dental professionals might respond more positively to the given scenarios:

Receptionist or staff members could question the patient about missed appointments, wife's absence, or illness.

When reviewing the medical history—when was the last medical visit? were medications added or eliminated?—the practitioner should note changes in medications and patterns of medication use and should ask about medications protocol. He or she should determine the date of the last comprehensive medical evaluation and confirm it with the physician's office if the patient is uncertain.

Maintaining "social notes" on an individual's chart facilitates conversation and comparisons. Social notes can include names of children and grandchildren, regular vacation spot, family pets, hobbies, and so on. Keep in mind that individuals who have numerous grandchildren with whom they are not in close contact may be unable to identify them all. However, in smaller and more closely knit families, the names of all grandchildren "should" be readily accessible.

Practitioners should contact a spouse or physician regarding the patient's behavior, identifying their "suspicions" and asking whether the other party has noticed these or other behavioral changes in the individual.

One should keep in mind that it is not uncommon for people to have a thought on "the tip of their tongue," which will generally be remembered later the same day. However, cognitively impaired individuals may not remember, even at a later time or date.

Cognitively impaired individuals will often maintain good social skills—that is, they will be responsive to social exchanges such as "Hi, how are you?" and will reply, "Fine, and how are you?" They will often appear successful in "light" conversation, but, although their responses "sound" right, they may at times be inaccurate. For example, they may identify the wrong type of weather for the day or claim never to have been in the office before.

Cognitively impaired individuals may complain of vague pain or discomfort but be unable to identify a specific location. Numerous tests or treatments may be recommended unnecessarily. When assessing an individual's pain, the practitioner should attempt to pinpoint the location, type of pain, duration, relief measures, and attempts to relieve it.

Having personal information available can be useful in maintaining a personal connection with the patient. This information should not be used as a true/false test but rather should be obtained as "new" information. For

example, one should say to the patient, "Do you have any pets? If so, what kind and what are their names?"—asking for specifics that can be confirmed through the chart or by a caregiver. By contrast, "How is your dog Wrigley doing?" is a general question and allows for a nonspecific response, which is more difficult to assess for accuracy and confirm with the patient's record than is the previous query.

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