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Cognitive Dysfunction, Medications, and Legal Issues

Clients having difficulty reading or understanding legal documents may be experiencing the side effects of medications. Here are some common drugs and their effects.

By Antoinette Harrison

Most quandaries about an elderly person's capacity begin with observations by those without formal training to discern the nature of the problem, including family members and elder law attorneys. The growing use of pharmaceuticals can have a significant effect on a client's ability to think clearly, raising questions about the ability of an elderly witness to remember and express important facts and the very ability of an aged individual to forge a lawyer-client relationship. Many clues to the causes and course of a client's impairment can be found by reading the prescription labels and understanding the typical use of the drugs and the possible side effects. With that knowledge base, an attorney can better decide who to consult and generally how to proceed to assist the client.

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As people age, their ability to remember may slow. With normal aging this occurrence is modest.¹ However, when dementia becomes apparent, the ability to remember or communicate may become markedly impaired. Dementia can be reversible or irreversible.² Reversible forms of dementia may be drug or disease related. Reversible dementia occurring due to disease may be from fever, urinary tract infection, thyroid problems, or vitamin B insufficiency. These forms of dementia are correctable if diagnosed and properly treated. Medication toxicity occurs in 2 to 12 percent of patients with suspected dementia. Irreversible dementia is most commonly recognized as Alzheimer's disease (AD). One of the distinguishing features of persons with irreversible dementia of the Alzheimer's type is that they demonstrate a *continuous* decline in cognitive function. A person who has variations in his/her cognitive function should seek medical care in order to rule out a reversible condition. This article will focus on dementia, its features, some of the causes, and how this condition can affect the person's ability to comprehend or sign legal documents.

Alzheimer's disease is the most common cause of dementia, accounting for 60 percent of all cases of late-life cognitive dysfunction.³ The primary complaint of the Alzheimer's patient is memory loss. The person will be unable to remember recent events and may begin to keep lists to assist himself or herself. This memory loss may progress until the person becomes lost when traveling to familiar locations, is unable to balance a checkbook, or is unable to write a check.

Another cardinal feature of AD is that the person becomes suspicious of his or her spouse, family members, or friends. Because AD patients cannot remember recent events, they may accuse their

spouses of stealing or hiding things from them. AD patients may become belligerent or abusive and difficult to control. Frequently, they begin "sundowning." Considered to be a sleep disturbance, this term refers to the individual being awake at night when the rest of the house is sleeping. The agitation and sleep disturbances may become so pronounced that the mate or family member seeks medical and/or legal help. The majority of nursing home admissions are for individuals diagnosed with dementia, who have become too difficult to manage safely at home.⁴

While Alzheimer's disease is a form of irreversible dementia, other forms of dementia can occur that are due to medications, substance abuse, trauma, disease, or vitamin deficiencies.⁵ Dementia is a neuropsychiatric disorder defined by widespread symptoms of memory loss and deficits in cognition or reasoning.⁶ Dementia occurring due to substance abuse is generally the result of alcohol use. There are over three million alcoholics in the U.S. population of people 60 years of age and older.⁷ The abuse of alcohol in the elderly population is responsible for excessive falls, frequent emergency room visits, and isolation. Alcohol abuse can result in features of dementia due to loss of vitamin B and folic acid depletion. Dementia patients will also have diminished intellectual capacity. Vitamin deficiencies alone may account for demented behaviors or visible tremors that can impair the individual's ability to understand and sign legal documents.⁸ Diagnosis by lab values can lead to appropriate vitamin replacement therapy, which will usually reverse the signs of dementia and tremor.

Trauma and disease may also contribute to reversible dementia. A more correct medical term for this would be "delirium." Delirium is characterized by a sudden deterioration in cognitive function and an inability to sustain attention.⁹ Urinary tract infections, constipation, recent head trauma, recent stroke, respiratory infections, and pain may cause delirium. Appropriate diagnosis and medical management can often correct the delirium secondary to the initial problem. By treating the infection, the mental changes may disappear. By alleviating pain, some of the agitation and dementia may improve.

The most common causes of reversible dementia are medications, often resulting from self-med-

ication by the older individual with over-the-counter (OTC) medicines. Other problems can be the result of side effects of OTC or prescription medications, overuse of medications, or drug interactions. One study by Lindley et al. (1992) noted that 72.8 percent of all adverse drug reactions detected following hospital admission were due to unnecessary use, drug interactions, or contraindications to use of medications.¹⁰ The three most commonly used types of nonprescription and prescription medications by the elderly are vitamins, analgesics, and cardiovascular drugs.¹¹ Antianxiety medicines (benzodiazepines), antihistamines, drugs to treat Parkinson's disease (anticholinergics), opioids (narcotics), and antidepressants (tricyclics) are among the most common causes of medication-induced dementia.¹² The use of four or more prescription drugs increases the risk of an adverse event associated with cognitive impairment; the relative risk is nine times higher than that of elderly patients taking fewer than four prescription medications.¹³ The following discussion will center on the aforementioned medications, the type of cognitive impairment induced, and the type of pharmacologic event leading to the cognitive impairment.

Vitamins

As previously mentioned, vitamin usage can be helpful in reversing dementia. Alcoholism can cause vitamin B₁ (thiamine) and B₁₂ depletion. Alcohol and drug dependence is common among the elderly and, if unrecognized, can lead to nutritional deficiencies that mimic dementia.¹⁴ Thiamine (B₁) deficiency can manifest itself as worsening heart failure, memory loss, or confusion. Vitamin B₁₂ deficiency can manifest itself as "pins and needles" tingling (paresthesia) or general weakness. Individuals with vitamin deficiencies will also show signs of irritability, confusion, personality changes, and dementia. Niacin deficiency can also cause mental changes manifested as the inability to sleep (insomnia), fatigue, anxiety, irritability, and nervousness. By replacing the vitamins, many of these changes can be reversed.

Analgesics

Elderly patients will often develop various arthritic conditions, the most common of which is osteoarthritis.¹⁵ The usual treatment for this is OTC analgesics. These can include acetaminophen

(Tylenol®), aspirin, and other nonsteroidal anti-inflammatory drugs (NSAIDs). The most commonly used NSAIDs are ibuprofen (Motrin®, Advil®) and naproxen (Anaprox®, Aleve®), also called nonnarcotic analgesics. Examples of narcotic analgesics include morphine (MS®, MS Contin®, Roxanol®), meperidine (Demerol®), oxycodone (Percodan®, Percocet®), hydrocodone (Vicodin®, Lortab®) and codeine (Tylenol #3®). Untreated pain can result in significant deterioration in the psychological condition of the individual. It may also result in an individual's inability to focus on the information being related to him or her regarding legal issues.

Narcotic analgesics very commonly cause a reversible confusional state, especially in the elderly patient.¹⁶ Elderly patients are especially sensitive to central nervous system (CNS) side effects of medications. Elderly patients taking narcotics may hallucinate while receiving these medications. Pentazocine (Talwin®) is a narcotic analgesic that causes more CNS side effects, including confusion and hallucinations, than other narcotic drugs.¹⁷ More commonly, these drugs cause respiratory depression, or the slowing of breathing functions.

Drugs that alter the heart or respiratory rates may lead to a condition called hypoxia, or low levels of oxygen. The brain needs oxygen to function properly. When drugs cause the heart to slow or breathing to slow, the elderly patient may experience hypoxia. Symptoms of hypoxia are impaired judgment and motor incoordination.¹⁸ The individual may appear drunk. If the hypoxia continues for a long period of time, the individual may appear fatigued, or drowsy, and be inattentive or slow to react. Analgesics, both narcotic and nonnarcotic, may directly or indirectly cause these events. Indirect events are due to drug interactions or drug accumulation. Use of nonnarcotic analgesics, particularly the NSAIDs, has been shown to cause occasional confusion in elderly patients.¹⁹ However, this is a very rare side effect. More commonly, the NSAIDs may cause worsening renal function, which can lead to fluid or drug accumulation. A common example is accumulation of digoxin (Lanoxin®), a frequently prescribed heart medication. For patients with heart failure, this can worsen until hospitalization is required. Drug accumulation may cause worsening side effects.

Cardiovascular Medications

Cardiovascular drugs are very commonly used by the elderly. These medications stimulate the heart to contract, slow the heart rate, lower blood pressure, or cause the blood vessels to dilate. Reversible dementia can often be caused by various cardiovascular drugs. Digoxin is the most commonly implicated cardiovascular medication. Digoxin is used to stimulate or increase the heart's ability to contract and pump out blood. This drug is eliminated by the body via the kidneys. When the elimination is slowed or reduced, the drug accumulates. Side effects of digoxin include slowing or irregular heartbeats, delirium, confusion, disorientation, nausea, vomiting, fatigue, and blurred vision.²⁰ Any of these effects can impair the individual's ability to read and sign documents. The delirium that accompanies this is reversed when the drug returns to therapeutic blood levels.

Another commonly used heart medication group is the beta-blockers. These include, but are not limited to, propranolol (Inderal®), metoprolol (Lopressor®, Toprol XL®), nadolol (Corgard®), and carvedilol (Coreg®). Beta-blockers are used to slow the heart rate and lower blood pressure. By themselves, beta-blockers are not likely to cause dementia; however, when combined with oral drugs that lower blood sugar (hypoglycemic agents), beta-blockers can cause problems. The beta-blockers may cover up the signs of hypoglycemia, or very low blood sugar. The individual who has hypoglycemia may become confused, disoriented, and belligerent. Similar to someone with hypoxia, an individual with hypoglycemia may appear to be drunk. This state can result in death if not promptly treated.²¹ Treatment consists of giving the person candy or orange juice to quickly increase the sugar level.

Other cardiovascular drugs implicated in cognitive decline are the calcium channel blocking agents (CCBs). A recently published Canadian study indicated that CCB users were twice as likely as nonusers to suffer a significant decline in cognitive performance.²² Calcium-channel blockers are cardiovascular drugs most commonly used to lower blood pressure and slow heart rate. Some examples of CCBs are verapamil (Calan®, Isoptin®), amlodipine (Norvasc®), nifedipine (Procardia®, Adalat®), and diltiazem (Cardizem).

Benzodiazepines

The medications that have been most commonly implicated in inducing cognitive changes have been the benzodiazepines, especially long-acting benzodiazepines.²³ These medications are typically used to treat anxiety or induce sleep. They include diazepam (Valium®), lorazepam (Ativan®), chlor-diazepoxide (Librium®), alprazolam (Xanax®), chlorazepate (Tranxene®), oxazepam (Serax®), prazepam (Centrax®), and triazolam (Halcion®). Benzodiazepines have been noted to impair immediate and delayed memory and psychomotor performance.²⁴ Abruptly stopping these drugs can lead to anxiety, agitation, and irritability. Rarely, but on occasion, confusion, delusions, hallucinations, or psychosis may also occur.²⁵ Typically, the long acting benzodiazepines will cause the individual to be very sleepy and possibly confused. Moreover, (longacting) benzodiazepines may accumulate in elderly patients, leading to profound sedation. Examples of long-acting benzodiazepines include diazepam (Valium®), flurazepam (Dalmane®), and clorazepate (Tranxene®).

Anticholinergics

Anticholinergic drugs are often implicated in causing drug-induced dementia or delirium.²⁶ Some of the most commonly used anticholinergic drugs are available over-the-counter (OTC) as sleep aides. Most OTC sleep aides contain the antihistamine diphenhydramine (Tylenol PM®, Nytol®, Sominex®) or doxylamine (Unisom®). Sleep disorders are common among the elderly, and characteristic changes in sleep stages are well documented.²⁷ Many elderly patients will self-medicate with these preparations. Overuse or accumulation of the anticholinergic side effects of these medications can result in drug-induced anticholinergic delirium. Other anticholinergic side effects include dry mouth, blurred vision, confusion, and hallucinations.²⁸

Anti-Parkinson's disease agents are also highly anticholinergic. These include trihexyphenidyl (Artane®) and benztropine (Cogentin®). Parkinson's patients typically display hand tremors and changes in their ability to move (akinesia). The disease itself causes these changes, but the medications used to counteract these changes may result in dementia or delirium.

Tricyclic antidepressant medications also have potent anticholinergic side effects. Additionally,

these drugs can cause irregular heartbeats (arrhythmia). The most commonly used tricyclic antidepressant is amitriptyline (Elavil®). Other tricyclics with potent anticholinergic side effects include chlomipramine (Anafranil®) and doxepin (Sinequan®).²⁹

In 1997 the Health Care Financing Administration (HCFA) issued new guidelines for drug use in institutionalized elderly. These recommendations were based on Beer's (1997) criteria.³⁰ Many of the recommendations were to avoid drugs with potent anticholinergic side effects unless there were no alternative medications to treat the condition, or the alternative medications were contraindicated for use in the individual. These guidelines were created subsequent to the high rate of adverse reactions in the elderly from anticholinergic effects. Some of the medications listed in the HCFA guidelines include diphenhydramine, amitriptyline, and gastrointestinal antispasmodic agents like Bentyl® and Levsin®.³¹

Other Drugs

As described previously, NSAIDs can reduce renal elimination, which is also diminished with age. Cimetidine (Tagamet®) is a drug that can accumulate when renal function is reduced. This drug, used to treat heartburn, is available OTC and by prescription. Both the liver and the kidneys eliminate cimetidine. When eliminated by the liver, it goes through a process known as drug metabolism. When cimetidine accumulates in elderly patients, a very common side effect is hallucinations. Other CNS side effects include confusion, agitation, and anxiety. Most often these effects are seen when this medication is given by intravenous infusion.

Dementia induced by medications can be reversible when the medication is stopped. Often the health care provider may not notice these side effects unless the clinician maintains a high rate of suspicion. Whenever working with elderly clients, keep in mind that their inability to focus or to read may be due to factors other than just being old. Visual and hearing impairment may make it appear that they are confused or demented, when in fact they may not be able to see what you wish them to read or hear what you are trying to say. Sometimes the medications the elderly are taking may further impair vision, as in the case of antihistamines and anticholinergic drugs.

Elderly clients may also suffer slowing of renal function, and many medications can accumulate. Use of more than four medications, both OTC and prescription, can increase the risk of drug interactions. These drug interactions may lead to additional side effects or lead to drug interactions. A single medication with potent anticholinergic effects might not cause delirium, but several medications combined may easily cause this due to cumulative anticholinergic effects. A common example would be the use of cough and cold preparations with OTC sleeping aids. Both may contain antihistamines, which have anticholinergic effects.

Conclusion

Elderly clients having difficulty reading, understanding, and signing legal documents may be having difficulty due to their age or due to other factors. In either case, it is important when working with the elderly that their dignity be maintained. In medicine, a common phrase used when prescribing medications is to "start low and go slow." In legal matters for the elderly, this is probably equally applicable.

Endnotes

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2. See generally AMERICAN PSYCHIATRIC ASSOCIATION, DIAGNOSTIC AND STATISTICAL MANUAL FOR MENTAL DISORDERS (DSM-IV) 123-174 (4th ed. 1992).
3. See generally Andrea Eggert and M. Lynn Crismon, *Current Concepts in Understanding Alzheimer's Disease*, 1 CLINICAL PHARMACY NEWSWATCH 1, 1-8 (1994).
4. See generally Charles P. Pollack et al., *Sleep Problems in the Community Elderly as Predictors of Death and Nursing Home Placement*, 15 J. COMMUNITY HEALTH 123, 123-25 (1990); see generally Charles P. Pollack and Deborah Perlick, *Sleep Problems and Institutionalization of the Elderly*, 4 J. GERIATRIC PSYCHIATRY AND NEUROLOGY 204, 204-10 (1991).
5. See generally George S. Alexopoulos et al., *Treatment of Agitation in Older Persons with Dementia*, POSTGRADUATE MEDICINE SPECIAL REPORT (April 1998).
6. See generally AMERICAN PSYCHIATRIC ASSOCIATION, *supra* note 2, at 123-74.
7. See Jeff C. Delafuente, *Therapeutics in the Elderly*, 22 NUTRITIONAL CONSIDERATIONS 423, 423-33 (1995).
8. See generally Kathleen M. Teasley-Strausburg and Jan D. Anderson, *Assessment of Nutritional Status and Nutritional Requirements*, 130 PHARMACOTHERAPY 2679, 2679-97 (1997).
9. See generally Michael H. Bross and Nancy O. Tatum, *Delirium in Elderly Patients*, 50 AM. FAMILY PHYSICIAN 1325, 1325-32 (1994).
10. See generally C.M. Lindley et al., *Inappropriate Medication is a Major Cause of Adverse Drug Reactions in Elderly Patients*, 21 AGE AND AGING 294, 294-300 (1992).
11. See generally Arthur M. Vener et al., *Drug Usage and Health Characteristics in Noninstitutionalized Retired Persons*, 27 J. AM. GERIATRIC SOC'Y. 83, 83-90 (1979); see generally William E. Hale et al., *Drug Use in an Ambulatory Elderly Population: A Five Year Update*, 21 DRUG INTELLIGENCE CLINICAL PHARMACY, 530, 530-35 (1987); see generally Dennis K. Helling et al., *Medication Use Characteristics in the Elderly: The Iowa 65+ Rural Health Study*, 35 J. AM. GERIATRIC SOC'Y. 4, 4-12 (1987).
12. See generally Shelley L. Gray et al., *Drug-Induced Cognition Disorders in the Elderly: Incidence, Prevention and Management*, 21 DRUG SAFETY: AN INT'L J. MED. TOXOLOGY AND DRUG EXPERIENCE 101, 101-22 (1999); see generally A.R. Moore and S.T. O'Keeffe, *Drug-Induced Cognitive Impairment in the Elderly*, 15 DRUGS AND AGING 15, 15-28 (1999).
13. See generally Eric B. Larson et al., *Adverse Drug Reactions Associated with Global Impairment in Elderly Persons*, 107 ANNALS INTERNAL MEDICINE, 169, 169-173 (1987).
14. See generally Norman S. Miller, *Alcohol and Drug Abuse Among the Elderly: Epidemiology, Diagnosis, and Treatment*, 32 COMPREHENSIVE PSYCHIATRY 153, 153-165 (1991).

15. See generally Kenneth D. Brandt, *Osteoarthritis*, HARRISON'S PRINCIPLES OF INTERNAL MEDICINE, 1935–41 (Anthony S. Fauci et al. eds., 14th ed. 1998).
16. See generally, Moore & Keeffe, *supra* note 12, at 15–28.
17. See generally Mark H. Beers, *Explicit Criteria for Determining Potentially Inappropriate Medication Use by the Elderly*, 157 ARCHIVES INTERNAL MED. 1531, 1531–36 (1997).
18. See generally Eugene Braunwald, *Hypoxia, Polycythemia and Cyanosis*, HARRISON'S PRINCIPLES, *supra* note 15, at 205–10.
19. See generally JOSEPH T. DEPIRO ET AL., PHARMACOTHERAPY, 1735–53 (3d ed. 1997).
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21. See generally Daniel W. Foster and Arthur H. Rubenstein, *Hypoglycemia*, HARRISON'S PRINCIPLES, *supra* note 15, at 2081–87.
22. See generally Collen J. Maxwell et al., *Calcium Channel Blockers and Cognitive Functioning in Elderly Patients: Results from the Canadian Study of Health and Aging*, 161 CANADIAN MED. ASS'N. J. 501, 510–06 (1999).
23. See generally Moore & Keeffe, *supra* note 12, at 15–28.
24. See generally American Psychiatric Association, *Benzodiazepine Dependence, Toxicity, and Abuse: A Task Force Report of the American Psychiatric Association* 1 AMERICAN PSYCHIATRIC PRESS (1990).
25. See generally Gray, *supra* note 12, at 101–22; see generally L.E. Tune and F.W. Bylsma, *Benzodiazepine-Induced and Anticholinergic-Induced Delirium in the Elderly*, 3 INT'L. PSYCHOGERIATRICS 397, 397–408 (1991).
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27. See generally James Walsh and T. Bedirhan Ustun, *Prevalence and Health Consequences of Insomnia*, SLEEP 427, 427–436 (1999).
28. See generally Charles A. Czeisler and Gary S. Richardson, *Disorders of Sleep and Circadian Rhythm*, HARRISON'S PRINCIPLES, *supra* note 15, at 5.
29. See generally FACTS AND COMPARISONS 459–483 (1998).
30. See generally Beers, *supra* note 17, at 1531–36.
31. See generally Health Care Finance Administration, *Guidelines to Surveyors—Long Term Care Facilities*, 120–23.12 (1999).