Sleep Disturbances in Dementia

What They Are and What To Do

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ABSTRACT

Approximately one quarter of adults with dementia experience sleep disturbances. The purpose of this article is to (a) describe and define sleep disturbances in individuals with dementia, (b) describe techniques to assess for sleep disturbances in individuals with dementia, and (c) provide nursing interventions to improve sleep in this patient population. Typical presentations of sleep disturbances in individuals with dementia are described, along with medications that may interfere with sleep. Suggestions for nursing measures that can be implemented to enhance sleep are also presented. Nurses have numerous nonpharmacological options to assist with the regulation of sleep-wake rhythms in individuals with dementia.

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Studies estimate that between one quarter and one half of older adults with Alzheimer's disease (AD) and other dementias experience some form of sleep disruption. The etiologies of sleep disruptions in AD are multifaceted. Degradation of neuronal pathways that initiate and maintain sleep, changes in the hypothalamic suprachiasmatic nucleus (the circadian "pacemaker" of the body), and other modifications in brain stem regions and pathways that regulate sleep-wake cycles have been implicated in the sleep disturbances observed in AD patients (Bliwise, 2004). Frequent manifestations of sleep disturbances in individuals with AD include reversal of day-night sleep pattern, frequent nighttime awakenings, increases in daytime sleep, and decreases in slow-wave sleep and rapid eye movement

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TABLE 1

SIGNS AND SYMPTOMS OF SLEEP DISORDERS

Nighttime
Apneic episodes
Falls
Frequent awakenings
Frequent leg movement during sleep or when lying awake in bed
Noticeable snoring
Talking while asleep
Wandering
Daytime
Agitation, hostility, or combativeness
Complaints by roommate or caregiver
Excessive daytime sleepiness and/or napping
Falling asleep early in the evening
Falls
Loss of physical function
Reduced cognitive function (i.e., problems in concentration, attention, memory)
Reduced participation in activities

Sources. American Medical Directors Association (2006); Bloom et al. (2009); Martin, Shochat, and Ancoli-Israel (2000).

sleep (Bliwise, 2004). Studies using global measures of cognition have reported that fragmented sleep increases in concert with severity of dementia. Further, lifestyle changes that often accompany progression of dementia, the presence of pain, and frequently prescribed medications for those with dementia may worsen sleep disturbances. The purpose of this article is to (a) describe and define sleep disturbances in individuals with dementia, (b) describe techniques to assess for sleep disturbances in individuals with dementia, and (c) provide nursing interventions to improve sleep in this patient population.

SLEEP DISTURBANCES IN DEMENTIA

Individuals with dementia experience excessive daytime sleepiness associated with fragmented sleep at night. As a result, such individuals often take frequent, short-duration naps throughout the day to make up for their lost sleep at night. In addition, other medically diagnosed sleep disturbances occur frequently in individuals with dementia.

In individuals with dementia who reside in long-term care facilities, the prevalence of obstructive sleep apnea has been estimated to be as high as 70% to 80% (Ancoli-Israel, 2006), yet estimates among the community-dwelling portion of this population are unknown. Sleep apnea is defined as irregular breathing at night due to complete or partial closure of the upper airways, accompanied by apneas (cessation of breathing) and hypoxemia (Panossian & Avidan, 2009). Risk factors for sleep apnea include elevated body mass index, supine sleep position, and increased age. Continuous positive airway pressure therapy has been shown to be well tolerated and effective for sleep apnea in those with AD (Ancoli-Israel et al., 2008). Periodic limb movements of sleep and restless legs syndrome diagnosed by polysomnography or formal sleep studies have been found to occur in individuals with cognitive impairment and are predictive of reduced total sleep time (Richards et al., 2008).

In older adults with cognitive impairment who reside in nursing home facilities, the presence of pain has been linked to sleep disturbances, as well as depressive symptoms and decrements in quality of life (Swafford, Miller, Tsai, Herr, & Ersek, 2009). Environmental factors, such as the presence of loud noises and limited exposure to bright light or natural sunlight, have been implicated as precursors for sleep disturbances in older adults with dementia.

ASSESSMENT OF SLEEP DISTURBANCES IN INDIVIDUALS WITH DEMENTIA

Nursing assessment is the foundation for the creation of any nursing care plan because it provides the evidence for the development of interventions. Assessment typically begins with an interview and a physical examination. If the patient is unable to provide a reliable sleep history, the nurse should talk with the patient's family member or caregiver. Sleep habits, history of sleep problems, and any medications or other substances (e.g., alcohol) used to promote sleep should be discussed. It is important to assess environmental, behavioral, and psychosocial factors that may be contributing to disturbed sleep. **Table 1** provides a list of signs and symptoms that indicate a sleep disorder.

The patient's medical history also holds clues to potential sleep

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problems. Nurses should look for risk factors and other chronic conditions, such as depression, that are commonly associated with nocturnal disturbances in sleep (**Table 2**). Certain medications and polypharmacy also create sleep disturbances, so the assessment should include careful consideration of all medications being taken (**Table 3**). In addition, the times of day medications are given can contribute to sleep problems. For example, a diuretic agent taken just before bedtime increases the probability of nocturia, and sedating medications taken in the morning can cause daytime napping.

A variety of survey instruments have been used to assess sleep in older adults and may be completed by a family member or caregiver. Simple sleep diaries can be used for caregivers to record bedtimes, describe nighttime awakenings, and document risetime. Identifying whether the person has more difficulty going to sleep or staying asleep may help determine the most effective interventions. For example, sleep onset difficulties are often related to anxiety, poor sleep hygiene, and restless legs syndrome (Susman, 2001). Sleep maintenance problems are often associated with chronic alcohol use, medication side effects, depression, or sleep apnea (Susman, 2001).

Validated rating scales of sleep symptoms can be helpful during the initial assessment as well as during follow up to determine the effectiveness of treatment interventions. The Sleep Disorders Inventory was developed and validated for patients with dementia and has great utility in both home and long-term care settings (Tractenberg, Singer, Cummings, & Thal, 2003). It describes the frequency, severity, and caregiver burden of sleep-disturbed behaviors within the previous 2 weeks. Symptoms described include difficulty falling asleep, getting up during the night, and sleeping excessively during the day (Tractenberg et al., 2003).

Daytime sleepiness can be quickly assessed using the Epworth Sleepiness Scale (Johns, 1991). Using a scale of 0 (*would never fall asleep*) to 3 (*high chance of falling asleep*), this questionnaire asks the patient or caregiver to rate the likelihood the patient would fall asleep during eight common situations. Questions can be omitted if they are not applicable (i.e., a question about being stopped in traffic can be omitted if the person no longer drives). A score of 10 or higher indicates the need to further assess for common sleep disorders.

Objective measures of sleep include wrist actigraphy and polysomnography. Actigraphy provides nonintrusive technology to assess sleep-wake cycles in individuals with dementia (Ancoli-Israel et al., 2003). Wrist actigraphs, similar to watches, are worn for several consecutive days. However, actigraphs are expensive and not readily available in the clinical setting. The gold standard of sleep assessment is polysomnography. This technology is the only way to obtain information on specific sleep stages, the presence of obstructive sleep apnea, and restless legs syndrome. A referral to a sleep specialist may be indicated if these disorders are suspected after assessment.

TABLE 2

COMMON CHRONIC CONDITIONS THAT AFFECT SLEEP

Chronic Condition	Effects on Sleep
Acute or chronic pain	Sleep onset difficulties, frequent awakenings
Congestive heart failure	Orthopnea, nocturia
Delirium	Fragmentation of sleep-wake cycle
Depression	Difficulty maintaining sleep, excessive sleepiness
Gastroesophageal reflux disease	Frequent awakenings due to coughing and heartburn/discomfort
Obesity	Snoring, apnea
Pulmonary disease	Awakenings due to coughing or shortness of breath

Sources. American Medical Directors Association (2006); Bloom et al. (2009).

NURSING INTERVENTIONS FOR PROMOTING SLEEP IN INDIVIDUALS WITH DEMENTIA

Sustained inadequate sleep hygiene may also be a risk factor for the development of sleep disturbance in older adults. *Sleep hygiene* refers to a number of sleep habits that can be performed to enhance sleep (**Table 4**). Although sleep hygiene is recommended for all older adults, no studies have specifically focused on the efficacy of sleep hygiene measures alone on improving sleep in individuals with dementia. Regardless, sleep hygiene measures remain the firstline treatment for impaired sleep.

Increasing daytime activity and physical exercise are known to

TABLE 3

MEDICATIONS ASSOCIATED WITH DISRUPTED SLEEP

Drug Class	Examples	Effects
Analgesic drugs	Nonsteroidal anti-inflammatory drugs	Decreased sleep efficiency
	Opioid drugs	Sedation, decreased REM and SWS
Antihistamine drugs (older varieties)	Diphenhydramine (Benadryl® and others)	Daytime sleepiness
Antihypertensive drugs	Beta blockers, alpha blockers	Insomnia, nightmares, vivid dreams, daytime fatigue
Antiparkinsonian drugs	Levodopa/carbidopa (Atamet®, Sinemet®) (high dosages), dopamine agonist drugs	Insomnia, daytime sleepiness
Antipsychotic drugs	Clozapine (Clozaril®), olanzapine (Zyprexa®), quetiapine (Seroquel®)	Sedation
Bronchodilator drugs	Theophylline (Slo-phyllin® and others), albuterol (AccuNeb® and others)	Sleep onset difficulties, increase in awakenings during night
Central nervous system stimulant drugs	Modafinil (Provigil®), caffeine	Sleep onset difficulties
Corticosteroid drugs	Prednisone (Deltasone®), dexamethasone (Decadron®)	Daytime fatigue, sleep onset difficulties, increase in awakenings during night
Decongestant drugs	Pseudoephedrine (Sudafed® and others), phenylephrine (Neo-Synephrine® and others)	Sleep onset difficulties
Histamine type-2 receptor antagonist drugs	Cimetidine (Tagamet®), ranitidine (Zantac®), famotidine (Pepcid®), nizatidine (Axid®)	Insomnia, somnolence
Lithium	Lithium	Daytime sleepiness
Stimulating antidepressant drugs	Protriptyline (Vivactil®), bupropion (Wellbutrin®, Zyban®), selective serotonin reuptake inhibitors, venlafaxine (Effexor®), monoamine oxidase inhibitors	REM sleep, short total sleep time

Sources. Ancoli-Israel & Ayalon (2009); Ancoli-Israel, Ayalon, and Salzman (2008); Mintzer & Burns (2000); Neubauer (2008); Salzman (2008).
Note. REM = rapid eye movement; SWS = slow wave sleep.

enhance sleep in individuals with dementia, as they may correct the circadian rhythm disturbances these individuals experience (King et al., 2008). Simple interventions, including increasing social activities (e.g., participation in an hour of simple games, engagement in other meaningful activities), have shown improvements in nighttime sleep in individuals with dementia (Richards, Beck, O'Sullivan, & Shue, 2005).

Exposure to bright light or more natural sunlight is recommended for individuals with dementia as well as older adults in general. Light plays a role in the regulation of melatonin rhythm and for circadian sleep-wake cycles. Because light is a *zeitgeber*, or "cue" for wakefulness, more exposure to light may be helpful in decreasing daytime sleepiness and thus promotion of nighttime sleep. Exposure to bright-light therapy in the morning or throughout the day has been shown to improve total nighttime sleep in individuals with dementia who reside in nursing facilities (Sloane et al., 2007).

As described above, a variety of medications, both prescription and over the counter, can interfere with sleep (**Table 3**). Medication effects can include vivid dreaming or nightmares (Neubauer, 2008). Medication schedules should be adjusted appropriately to prevent creation or exacerbation of sleep problems.

CONCLUSION

Sleep disturbances occur frequently in individuals with dementia, oftentimes increasing as the severity of dementia increases. Changes in the brain region, in addition to normal changes in sleep as a result of aging, add to the sleep disturbances experienced by older adults with dementia. Numerous nonpharmacological measures

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TABLE 4

NONPHARMACOLOGICAL NURSING INTERVENTIONS TO PROMOTE SLEEP

Category	Intervention	Rationale
Sleep hygiene measures	Limit caffeine (e.g., coffee, tea, soft drinks, chocolate), cigarettes, stimulant agents, and alcohol	Stimulant products promote wakefulness
	If medically able, increase activity in the afternoon or early evening, but not close to bedtime	Promotes daytime arousal, reduces daytime napping, and reduces depression
	Increase exposure to bright light or sunlight during the day and early evening hours	Helps maintain circadian rhythms, which are established by patterns of light and dark
	Avoid napping, if possible, or limit to one nap of less than 30 minutes	Weakens the homeostatic drive to sleep
	Check the effect of medications on sleep	See **Table 3**
	Maintain comfortable temperature, darkness, and proper ventilation in bedroom	A comfortable sleep environment promotes sleep
	Minimize light and noise exposure as much as possible	Light and noise disrupt sleep
	Eat a light snack if hungry	Hunger can keep a person awake
	Avoid heavy meals at bedtime	Reduces nighttime awakenings caused by gastroesophageal reflux disease
	Limit liquids in the evening	Reduces nighttime awakenings caused by nocturia
	Keep a regular schedule (i.e., rest and retire at the same time every day, eat and exercise on a regular schedule)	Maintaining temporal patterns of rest and activity enhances synchrony with circadian rhythm
	Practice stress-management techniques (i.e., discuss worries and stressful events enough time before bedtime, practice progressive muscle relaxation or other techniques to promote relaxation)	Reducing stress and promoting relaxation at bedtime will augment a person's readiness for sleep
Environment	Use a noise machine to provide "white noise"	Has been shown to promote sleep maintenance in some populations
Massage	Provide slow-stroke back massage during bedtime routine	Has been shown to promote sleep in nursing home residents with dementia
Delirium	Assess for signs of delirium; to prevent delirium, frequently reorient the person by keeping clocks and calendars in living and sleeping areas, maintain a regular schedule, and keep day and night associated with environmental light and dark	These measures reduce anxiety and help maintain circadian rhythms

Sources. Ancoli-Israel and Ayalon (2009); Cole and Richards (2007); Floyd (1999); Harris (2009); Smith (2002).

can be undertaken by nurses to assist with the regulation of sleep-wake rhythms in individuals with dementia. Increasing adherence to basic sleep hygiene measures, promoting increased levels of activity and exercise, and augmenting the amount of exposure to sunlight and bright light are firstline treatments for sleep disturbances in individuals with dementia. A thorough evaluation of all medications, both prescription and over the counter, is warranted, as many medications interfere with sleep. Further, if obstructive sleep apnea is diagnosed in individuals with dementia, a trial use of a continuous positive airway pressure machine is warranted.

REFERENCES

American Medical Directors Association. (2006). *Clinical practice guideline: Sleep disorders*. Columbia, MD: Author.

Ancoli-Israel, S. (2006). The impact and prevalence of chronic insomnia and other sleep disturbances associated with chronic illness. *American Journal of Managed Care, 12*(8 Suppl.), S221-S229.

Ancoli-Israel, S., & Ayalon, L. (2009). Diagnosis and treatment of sleep disorders in older adults. *Focus, 7*, 98-105.

Ancoli-Israel, S., Ayalon, L., & Salzman, C. (2008). Sleep in the elderly: Normal variations and common sleep disorders. *Harvard Review of Psychiatry, 16*, 279-286.

Ancoli-Israel, S., Cole, R., Alessi, C., Chambers, M., Moorcroft, W., & Pollak, C.P. (2003). The role of actigraphy in the study of sleep and circadian rhythms. *Sleep, 26*, 342-392.

Ancoli-Israel, S., Palmer, B.W., Cooke, J.R., Corey-Bloom, J., Fiorentino, L., Nata-

rajan, L., et al. (2008). Cognitive effects of treating obstructive sleep apnea in Alzheimer's disease: A randomized controlled study. *Journal of the American Geriatrics Society, 56,* 2076-2081.

Bliwise, D.L. (2004). Sleep disorders in Alzheimer's disease and other dementias. *Clinical Cornerstone, 6*(Suppl. 1A), S16-S28.

Bloom, H.G., Ahmed, I., Alessi, C.A., Ancoli-Israel, S., Buysse, D.J., Kryger, M.H., et al. (2009). Evidence-based recommendations for the assessment and management of sleep disorders in older persons. *Journal of the American Geriatrics Society, 57,* 761-789.

Cole, C., & Richards, K. (2007). Sleep disruption in older adults. Harmful and by no means inevitable, it should be assessed for and treated. *American Journal of Nursing, 107*(5), 40-49.

Floyd, J.A. (1999). Sleep promotion in adults. *Annual Review of Nursing Research, 17,* 27-56.

Harris, M. (2009). *The effects of slow-stroke back massage on the sleep of persons with dementia in the nursing home: A pilot study* (Unpublished doctoral dissertation). University of Arkansas for Medical Sciences, Little Rock.

Johns, M.W. (1991). A new method for measuring daytime sleepiness: The Epworth Sleepiness Scale. *Sleep, 14,* 540-545.

King, A.C., Pruitt, L.A., Woo, S., Castro, C.M., Ahn, D.K., Vitiello, M.V., et al. (2008). Effects of moderate-intensity exercise on polysomnographic and subjective sleep quality in older adults with mild to moderate sleep complaints. *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences, 63,* 997-1004.

Martin, J., Shochat, T., & Ancoli-Israel, S. (2000). Assessment and treatment of sleep disturbances in older adults. *Clinical Psychology Review, 20,* 783-805.

Mintzer, J., & Burns, A. (2000). Anticholinergic side-effects of drugs in elderly people. *Journal of the Royal Society of Medicine, 93,* 457-462.

Neubauer, D.N. (2008). Medication effects on sleep. In *ACCP Sleep Medicine Board review* (pp. 117-134). Northbrook, IL: American College of Chest Physicians.

Panossian, L.A., & Avidan, A.Y. (2009). Review of sleep disorders. *Medical Clinics of North America, 93,* 407-425, ix.

Richards, K.C., Beck, C., O'Sullivan, P.S., & Shue, V.M. (2005). Effect of individualized social activity on sleep in nursing home residents with dementia. *Journal of the American Geriatrics Society, 53,* 1510-1517.

Richards, K.C., Roberson, P.K., Simpson, K., Lambert, C.W., Bliwise, D.L., Cole C.S., et al. (2008). Periodic leg movements predict total sleep time in persons with cognitive impairment and sleep disturbance. *Sleep, 31,* 224-232.

Salzman, C. (2008). Pharmacologic treatment of disturbed sleep in the elderly. *Harvard Review of Psychiatry, 16,* 271-278.

Sloane, P.D., Williams, C.S., Mitchell, C.M., Preisser, J.S., Wood, W., Barrick, A.L., et al. (2007). High-intensity environmental light in dementia: Effect on sleep and activity. *Journal of the American Geriatrics Society, 55,* 1524-1533.

Smith, A. (2002). Effects of caffeine on human behavior. *Food and Chemical Toxicology, 40,* 1243-1255.

Susman, J.L. (2001). Sleep. In R.J. Ham, P.D. Sloane, & G.A. Warshaw (Eds.), *Primary care geriatrics: A case-based approach* (4th ed., pp. 437-444). St. Louis: Mosby.

Swafford, K.L., Miller, L.L., Tsai, P.F., Herr, K.A., & Ersek, M. (2009). Improving the process of pain care in nursing homes: A literature synthesis. *Journal of the American Geriatrics Society, 57,* 1080-1087.

Tractenberg, R.E., Singer, C.M., Cummings, J.L., & Thal, L.J. (2003). The Sleep Disorders Inventory: An instrument for studies of sleep disturbance in persons with Alzheimer's disease. *Journal of Sleep Research, 12,* 331-337.

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