



Published in final edited form as:

*J Gerontol Nurs.* 2010 May ; 36(5): 9–14. doi:10.3928/00989134-20100330-05.

## Sleep disturbances in dementia: What they are and what to do

**Karen M. Rose, PhD, RN**[Assistant Professor of Nursing],  
University of Virginia

**Claire M. Fagin**[Post-doctoral Fellow], and  
P.O. Box 800782, 202 Jeanette Lancaster Way, Charlottesville, VA 22908

**Rebecca Lorenz, PhD, RN**[Assistant Professor of Nursing]  
St. Louis University

### Abstract

Approximately one-quarter of adults with dementia experience sleep disturbances. The purpose of this paper is to describe and define sleep disturbances in persons with dementia; describe techniques to assess for sleep disturbances in persons with dementia; and to provide nursing interventions to improve sleep in this patient population. Typical presentations of sleep disturbances in persons with dementia are described, along with medications that may interfere with sleep, and suggestions for nursing measures that can be implemented to enhance sleep are presented. Numerous non-pharmacological measures can be undertaken by nurses to assist with the regulation of sleep-wake rhythms in persons with dementia.

### Background

Studies estimate that between one-quarter and one half of older adults with Alzheimer's disease (AD) and other dementias suffer from some form of sleep disruption. The etiologies of sleep disruptions in AD are multi-faceted. 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 brainstem 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 persons with AD include day-night sleep pattern reversals, frequent nighttime awakenings, increases in daytime sleep, and decreases in slow-wave sleep and rapid eye movement sleep (Bliwise, 2004). Studies that used global measures of cognition have reported that fragmented sleep increases in concert with severity of dementia. Further, lifestyle changes that oftentimes accompany progression of dementia, the presence of pain, and frequently-prescribed medications that persons with dementia take may worsen sleep disturbances. The purpose of this paper is to describe and define sleep disturbances in persons with dementia; describe techniques to assess for sleep disturbances in persons with dementia; and to provide nursing interventions to improve sleep in this patient population.

### Sleep Disturbances in Dementia

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

In persons with dementia who reside in long-term care facilities, the prevalence of obstructive sleep apnea has been estimated to be as high as 70% - 80% (Ancoli-Israel, 2006); while estimates of sleep apnea in community-dwelling persons with dementia 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. Periodic limb movements of sleep (PLMS) as diagnosed by polysomnography or a “sleep study” have been found to occur in persons 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 to depressive symptoms and to 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 being precursors for sleep disturbances in older adults with dementia.

### **Assessment of Sleep Disturbances in Persons with Dementia**

Nursing assessment is the foundation to the identification and development of any nursing care plan because it provides the evidence for the development of interventions. Assessment typically begins with an interview and a physical assessment. If your client is unable to provide a reliable sleep history, be sure to talk with his or her family member or caregiver. Ask about sleep habits, history of sleep problems, and any medications or other substances, like alcohol, that were used to promote sleep (see Table 1). Be sure to assess environmental, behavioral, and psychosocial factors that may be contributing to disturbed sleep.

The person's medical history is also holds clues to potential sleep problems. Look for risk factors and other chronic conditions, such as depression, that are commonly associated with nocturnal disturbances in sleep (see Table 2). Certain medications and poly-pharmacy also create sleep disturbances so the assessment should include careful consideration of all medications (see Table 3). Be sure to consider the times of day medications are given as potential contributors to sleep problems. For example, is a diuretic given just before bedtime, increasing the probability of nocturia? Or, are sedating medications given in the morning, causing 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 kept where the family member records time to bed, describes nighttime awakenings, and documents rise time. Identifying whether the person has more difficulty going to sleep or staying asleep may help you 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 (Tractenberg, Singer, Cummings, & Thal, 2003). It describes the frequency, severity, and caregiver burden of sleep-disturbed behaviors within the previous two 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). The questionnaire asks the person or the caregiver to rate the chance that she or he would fall asleep during eight common situations using a scale of 0 to 3 indicating that they would never fall asleep to having a high chance of falling asleep. Questions, such as being stopped in traffic, can be omitted if the person no longer drives. A score of 10 or more indicates the need to further assess for common sleep disorders.

Objective measures of sleep include wrist actigraphs and polysomnography (PSG). Actigraphy provides nonintrusive technology to assess sleep-wake cycles in persons with dementia (Ancoli-Israel et al., 2003). They are worn for several consecutive days, like a watch. However, actigraphs are expensive and not readily available in the clinical setting.

The gold standard of sleep assessment is polysomnography (PSG). This technology is the only way to obtain information on specific sleep stages, the presence of obstructive sleep apnea, and restless leg syndrome. A referral to a sleep specialist may be indicated if these disorders are suspected based on your assessment.

## Nursing Interventions for Promote Sleep in Persons with Dementia

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

Increasing daytime activity and physical exercise are known to enhance sleep in persons with dementia, as they may correct the circadian rhythm disturbances that these persons experience. Simple interventions, including increasing social activities, such as participation in an hour of simple games or engaged in other meaningful activities, have shown improvements in nighttime sleep in persons with dementia (Richards, Beck, O-Sullivan, & Shue, et al., 2005).

Exposure to bright light or to more natural sunlight is recommended for persons with dementia as well as for 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 persons with dementia who reside in nursing facilities (Soalne, Williams, Mitchell, et al., 2007).

As described above, a variety of medications, prescribed and over-the-counter, can interfere with sleep (see Table 1). Medication effects can include vivid dreaming or nightmares (Naubauer, 2008). Medication schedules should be adjusted appropriately to prevent sleep problems from being created or exacerbated.

## Conclusions

Sleep disturbances occur frequently in persons with dementia, oftentimes increasing as the progression of 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 that are experienced by older adults with dementia. Numerous non-pharmacological measures can be undertaken by nurses to assist with the regulation of sleep-wake rhythms in persons with dementia. Increasing adherence to basic sleep hygiene measures, promoting increased levels

of activity and exercise, and augmenting the amount of sunlight and bright light that persons with dementia are exposed to are first-line treatments for sleep disturbances in this patient population. A thorough evaluation of all medications that are prescribed and that are being taken over-the-counter is warranted, as many medications interfere with sleep. Further, if obstructive sleep apnea is diagnosed in persons with dementia, a trial of the use of a continuous positive pressure machine is warranted.

## References

- American Medical Directors Association. Rep. No. Product Code CPG21. Columbia, Maryland: AMDA Foundation; 2006. Clinical practice guidelines: Sleep disorders in the long-term care setting.
- Ancoli-Israel S, Ayalon L, Salzman C. Sleep in the elderly: normal variations and common sleep disorders. *Harv Rev Psychiatry*. 2008; 16:279–286. [PubMed: 18803103]
- Ancoli-Israel S, Ayalon L. Diagnosis and Treatment of Sleep Disorders in Older Adults. *Focus*. 2009; 7:98–105.
- Ancoli-Israel S, Cole R, Alessi C, Chambers M, Moorcroft W, Pollak CP. The role of actigraphy in the study of sleep and circadian rhythms. *Sleep*. 2003; 26:342–392. [PubMed: 12749557]
- Ancoli-Israel S. The impact and prevalence of chronic insomnia and other sleep disturbances associated with chronic illness. *American Journal of Managed Care*. 2006; 12(8 Suppl):S221–S229. [PubMed: 16686592]
- Bierman EJ, Comijs HC, Jonker C, Beekman AT. Symptoms of anxiety and depression in the course of cognitive decline. *Dementia & Geriatric Cognitive Disorders*. 2007; 24(3):213–219. [PubMed: 17690554]
- Bliwise D. Sleep disorders in Alzheimer's disease and other dementias. *Clinical Cornerstone*. 2004; 6(1):S16–S28. [PubMed: 15259536]
- Bloom HG, Ahmed I, Alessi CA, Ancoli-Israel S, Buysse DJ, Kryger MH, et al. Evidence-based recommendations for the assessment and management of sleep disorders in older persons. *J Am Geriatr Soc*. 2009; 57:761–789. [PubMed: 19484833]
- Cole C, Richards K. Sleep disruption in older adults. Harmful and by no means inevitable, it should be assessed for and treated. *Am J Nurs*. 2007; 107:40–49. [PubMed: 17443076]
- Cooke JR, Ancoli-Israel S. Sleep and its disorders in older adults. *Psychiatric Clinics of North America*. 2006; 29(4):1077–1093. [PubMed: 17118283]
- Czeisler CA, Allan JS, Strogatz SH, Ronda JM, Sanchez R, Rios CD, et al. Bright light resets the human circadian pacemaker independent of the timing of the sleep-wake cycle. *Science*. 1986; 233:667–671. [PubMed: 3726555]
- Floyd JA. Sleep promotion in adults. *Annu Rev Nurs Res*. 1999; 17:27–56. [PubMed: 10418652]
- Foley D, Ancoli-Israel S, Britz P, Walsh J. Sleep disturbances and chronic disease in older adults: Results of the 2003 National Sleep Foundation Sleep in America Survey. *Journal of Psychosomatic Research*. 2004; 56(5):497–502. [PubMed: 15172205]
- Harris, M. Ph D. University of Arkansas for Medical Sciences; 2009. The effects of slow-stroke back massage on the sleep of persons with dementia in the nursing home: A pilot study.
- Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep*. 1991; 14:540–545. [PubMed: 1798888]
- Landi F, Russo A, Bernabei R. Physical activity and behavior in the elderly: a pilot study. *Arch Gerontol Geriatr Suppl*. 2004:235–241. [PubMed: 15207420]
- Martin J, Shochat T, Ancoli-Israel S. Assessment and treatment of sleep disturbances in older adults. *Clin Psychol Rev*. 2000; 20:783–805. [PubMed: 10983268]
- Mintzer J, Burns A. Anticholinergic side-effects of drugs in elderly people. *J R Soc Med*. 2000; 93:457–462. [PubMed: 11089480]
- Namazi KH, Zadorozny CA, Gwinnup PB. The influences of physical activity on patterns of sleep behavior of patients with Alzheimer's disease. *Sleep Med*. 2009

- Naubauer, DN. ACCP Sleep Medicine Board Review. Northbrook, IL: American College of Cardiologists; 2008. Medication effects on sleep; p. 117-134.
- Owens JA, Avidan A, Baldwin D, Landrigan C. Improving sleep hygiene. *Archives of Internal Medicine*. 2008; 168(11):1229–1230. [PubMed: 18541835]
- Panossian LA, Avidan AY. Review of sleep disorders. *Medical Clinics of North America*. 2009; 93(2): 407–425. [PubMed: 19272516]
- Richards KC, Beck C, O'Sullivan PS, Shue VM. Effect of individualized social activity on sleep in nursing home residents with dementia. *J Am Geriatr Soc*. 2005; 53:1510–1517. [PubMed: 16137280]
- Salzman C. Pharmacologic treatment of disturbed sleep in the elderly. *Harv Rev Psychiatry*. 2008; 16:271–278. [PubMed: 18803102]
- Sloane PD, Williams CS, Mitchell CM, et al. High-intensity environmental light in dementia: Effect on sleep and activity. *Journal of the American Geriatrics Society*. 2007; 55:1523–1533.
- Smith A. Effects of caffeine on human behavior. *Food Chem Toxicol*. 2002; 40:1243–1255. [PubMed: 12204388]
- Tractenberg RE, Singer CM, Cummings JL, Thal LJ. The Sleep Disorders Inventory: an instrument for studies of sleep disturbance in persons with Alzheimer's disease. *J Sleep Res*. 2003; 12:331–337. [PubMed: 14633245]

**Table 1**  
**Signs and symptoms indicating a sleep disorder**

---

**Nighttime**

---

- Apneic episodes
- Frequent awakenings
- Noticeable snoring
- Wandering
- Falls
- Talking while asleep
- Frequent leg movement during sleep or when lying in bed awake

---

**Daytime**

---

- Agitation, hostility, combativeness
- Excessive daytime sleepiness and/or napping
- Falls
- Reduced cognitive function: problems in concentration, attention, and memory
- Loss of physical function
- Falling asleep early in the evening
- Reduced participation in activities
- Complaints by roommate or caregiver

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

**Table 2**  
**Common chronic conditions**

<b>Chronic conditions</b>	<b>Effects on sleep</b>
Depression	Difficulty maintaining sleep, excessive sleepiness
Congestive Heart Failure	Orthopnea and nocturia
Pulmonary disease	Awakenings: coughing, shortness of breath
Delirium	Sleep-wake cycle fragmentation
Acute or chronic pain	Sleep onset difficulties, frequent awakenings
Gastroesophageal reflux disease (GERD)	Frequent awakenings: coughing
Obesity	Snoring, apnea

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

**Table 3**  
**Medications associated with disrupted sleep**

Type	Examples	Effect
Central Nervous System stimulants	Modanfinil, Caffeine	Sleep onset difficulties
Stimulating antidepressants	Protriptyline, bupropion, selective serotonin reuptake inhibitors, venlafaxine, monoamine oxidase inhibitors	Reduced REM sleep, short total sleep time
Lithium	Lithium	Daytime sleepiness
Antihypertensives	Beta-blockers, alpha blockers	Insomnia, nightmares, vivid dreams, daytime fatigue
Bronchodilators	Theophylline, albuterol	Sleep onset difficulties, increase in awakenings during night
Corticosteroids	Prednisone, dexamethasone	Daytime fatigue, sleep onset difficulties, and increase in awakenings during night
Decongestants	Pseudoephedrine, phenylephrine	Sleep onset difficulties
Antihistamines	diphenhydramine	Daytime sleepiness (older varieties)
Histamine Type 2 receptor antagonists	Cimetidine, ranitidine, famotidine, and nizatidine	Insomnia and somnolence
Analgesics	Nonsteroidal Anti-inflammatory Drugs Opioids	Decreased sleep efficiency, Sedation, decrease REM and SWS
Antiparkinsonian Drugs	Levodopa/carbidopa (high doses), Dopamine agonists	Insomnia, daytime sleepiness
Antipsychotic Drugs	Clozapine, Olanzapine, Quetiapine	Sedation

Sources: (Ancoli-Israel, Ayalon, & Salzman, 2008; Salzman, 2008; Neubauer, 2008; Ancoli-Israel & Ayalon, 2009; Mintzer & Burns, 2000)



**Table 4**  
**Nonpharmacologic Nursing Interventions to Promote Sleep**

Category	Intervention	Rationale
Sleep Hygiene Measures	Limit caffeine (coffee, tea, soft drinks, and chocolate), cigarettes, stimulants, and alcohol	These are stimulants that promote wakefulness
	If medically able, increase activity in the afternoon or early evening (not close to bedtime)	Promotes daytime arousal, reduces daytime napping, and reduces depression
	Increase exposure to bright light and/or sunlight during the day and early evening hours	Helps maintain circadian rhythm, 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 good 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	This reduces nighttime awakenings caused by GERD
	Limit liquids in the evening	This reduces nighttime awakenings caused by nocturia
	Keep a regular schedule	Maintaining temporal patterns of rest and activity enhances synchrony with circadian rhythm
	Practice stress-management techniques	Reducing stress and promoting relaxation at bedtime will augment a person's readiness for sleep
	Environment	Use a noise machine to provide "white noise"
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: (Smith, 2002; Cole & Richards, 2007; Ancoli-Israel & Ayalon, 2009; Floyd, 1999; Harris, 2009)