Sleep Disorders: An Underrecognized Comorbidity in Long-term Care

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Objectives

- Review the epidemiology of sleep disorders in elderly patients, especially in long-term care.
- Discuss some of the known associations between sleep disorders and geriatric syndromes.
- Review how sleep disorders may affect outcomes in long-term care settings.
- Discuss ways to improve sleep for older adults in long-term care settings.
What is Sleep?

Sleep is generally characterized by:

- Decreased reaction to external stimuli
- Reduction in voluntary body movement
- Loss of consciousness
- Temporary blindness
- 70% reduction in audio receptivity
- Increased rate of anabolism (synthesis of cell structures)
- Decreased rate of catabolism (breakdown of cell structures).

http://en.wikipedia.org/wiki/Sleep
What is Aging?

- Aging is generally characterized by:
  - Decreased ability to cope with external insults (homeostenosis)
  - Reduction in mobility (i.e. disability)
  - Loss of memory/cognitive function
  - Visual loss
  - Hearing loss
  - *Decreased* rate of anabolism (synthesis of cell structures)
  - *Increased* rate of catabolism (breakdown of cell structures).
Epidemiology of Sleep Disorders Among Older Adults

- As many as 50% of older individuals complain about sleep problems
  - Disturbed or “light” sleep
  - Frequent awakenings
  - Daytime sleepiness

- Consequences of “poor sleep”
  - Impaired daytime function
  - Compromised quality of life (QOL)

The Sleep Cycle

www.ultracrepidate.com
Changes in Sleep with Aging

- Repeated and frequent interruption of sleep by long periods of wakefulness.
  - Age-dependent intrinsic lightening of sleep homeostatic processes
- Easier arousal from nighttime sleep by auditory stimuli
  - Increased sensitivity to environmental stimuli
Changes in Sleep with Aging

- Increases in daytime sleepiness and napping.
- Tendency to fall asleep and awaken earlier.
  - “Owls” becoming “larks”
- Less tolerant of phase shift in time of the sleep-wake schedule.
  - e.g. jet lag, shift work
# Causes of Poor Sleep in Older Adults

<table>
<thead>
<tr>
<th>Cause or Problem</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiologic</td>
<td>Age-related sleep change</td>
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<tr>
<td></td>
<td>Age-related circadian rhythm change (phase advance)</td>
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<td>Medical illnesses</td>
<td>Arthritis or other causes of chronic pain</td>
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<td></td>
<td>Congestive heart failure, COPD</td>
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<td>Gastroesophageal reflux disease</td>
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<td>Psychiatric illnesses</td>
<td>Depression</td>
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<td>Medications</td>
<td>Diuretics (nocturia)</td>
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<td>Inappropriate use of OTC medications</td>
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Vitiello MV, *Sleep Med Clin* 2006
# Causes of Poor Sleep in Older Adults

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</tr>
</thead>
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<tr>
<td>Primary sleep disorders</td>
<td>Sleep disordered breathing (sleep apnea)</td>
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<td></td>
<td>Restless legs syndrome</td>
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<td></td>
<td>REM behavior disorder</td>
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<td>Behavioral or social</td>
<td>Retirement or lifestyle change</td>
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<td>Death of a family member or friend</td>
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<td>Inappropriate use of social drugs</td>
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<td>Transmeridian air travel</td>
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<td>Napping</td>
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<td>Environmental</td>
<td>Bedroom environment</td>
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<td>New home/ smaller space/ institution</td>
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Geriatric Syndromes and Sleep

- Dementia
  - Alzheimer’s disease
  - Parkinson’s disease
  - Multi-infarct dementia
- Depression
- Falls
- Osteoporosis
- Urinary Incontinence
Chronic Medical Conditions and Sleep

- Congestive heart failure
- Chronic obstructive lung disease
- Diabetes mellitus
- Stroke
- Chronic kidney disease
Insomnia and Cognition

- Insomnia affects 12-25% of individuals age 65 and older.
- Sleeping pills for insomnia are among the most commonly prescribed medications.
  - Between 5% and 33% of older adults in N. America and the United Kingdom.
- Neuropsychologic tests demonstrate objective impairments in older adults with insomnia.
- Chronic insomnia is a significant independent risk factor for cognitive decline.

Obstructive Sleep Apnea (OSA) and Cognition

- OSA affects as many as 42% of those age 65 and older.
- OSA contributes to excessive sleepiness, depression, irritability, and functional impairment.
- Risk of a motor vehicle accident increases with OSA.
- OSA contributes to hypertension, increased risk of heart disease and stroke.
- Vigilance, including sustained attention, controlled attention, efficiency of information processing and reaction time are the most commonly affected cognitive domains.

Alzheimer’s disease and Sleep

- Sleep changes:
  - Reduction in sleep efficiency
  - Increase in non-REM stage 1 sleep
  - Increase in arousal and awakening frequency
  - Decrease in total sleep time
  - Reduction in sleep spindles and K complexes

- Circadian rhythm disturbances can present as insomnia or hypersomnia in these patients.

- Sleep disordered breathing disorders such as OSA are very common in AD compared with nondemented elderly.

Parkinson’s disease and Sleep

- Estimated that 60-90% of PD patients have sleep complaints.

- Sleep changes:
  - Difficulty in turning over in bed
  - Leg cramps, leg jerks and dystonic spasms are common
  - Frequent awakening (sleep fragmentation) and early awakening

- Associated with REM behavioral disorder (RBD).

- Medications used to treat PD are often sedating.

Habitual snoring may have adverse effects on long-term stroke outcome.

Central sleep apnea and sometimes Cheyne-Stokes breathing may be a latent phenomena after a stroke, affecting 30-40% of patients.

Central hypoventilation syndrome and failure of automatic breathing (Ondine’s curse) are more typically associated with brainstem strokes.

Patients with Binswanger’s disease or subcortical leukoencephalopathy are at increased risk for RBD.

Depression and Sleep

- Insomnia has a stronger association with depression than any other medical condition.
- Sleep complaints often precede the onset of depression.
- Sleep changes:
  - Prolonged time to sleep onset
  - Decreased sleep efficiency
  - Poor sleep continuity
  - Increased early morning awakening
- Sleep deprivation common among caregivers, especially when complicated by bereavement.

Osteoarthritis and Sleep

- Affects 50-80% of the elderly population
- Nearly 60% experience pain during the night.
- Sleep changes:
  - Problems initiating sleep (31%)
  - Problems maintaining sleep (81%)
  - Tendency to awaken early in the morning (51%)
- Poor sleep in these patients correlates with increased perceived pain, decreased self-rated health, poor functional status and depression.
- Cognitive behavioral approaches may be helpful.

Congestive Heart Failure and Sleep

- Sleep change: disturbed maintenance of sleep
  - Orthopnea
  - Paroxysmal nocturnal dyspnea
  - Nocturia
  - Sleep-disordered breathing

- More than 50% of CHF patients experience Cheyne-Stokes respiration.
  - Can lead to increased sleep fragmentation and daytime sleepiness

- An independent predictor of OSA in both men and women and central sleep apnea in women.

Chronic Obstructive Lung Disease and Sleep

- About 25% of COPD patients complain of excessive sleepiness.

- “Overlap syndrome”
  - Coexistence of OSA and COPD
  - 12-41% of OSA patients (VA sample)

- Although oxygen therapy frequently corrects underlying hypoxemia, it does not seem to improve sleep quality.
  - Cough, impaired airflow, excessive respiratory secretions or dyspnea may be contributing to sleep disturbance.

Urinary Incontinence and Sleep

- Common symptoms:
  - Urinary frequency
  - Nocturia
  - Incontinence

- Nocturia is a well-recognized cause of disturbed sleep maintenance in later life, associated with poor sleep quality and daytime sleepiness.

Chronic Kidney Disease and Sleep

- Insomnia in hemodialysis patients ranges from 45-86%.

- Sleep problems:
  - Reduction in total sleep time
  - Decreased sleep efficiency
  - Reduced total REM sleep

- Patients on hemodialysis have a higher prevalence of OSA, RLS, PLMD, insomnia and excessive daytime sleepiness.

- Over 50% of these patients have chronic pain, which is significantly associated with insomnia and depression.

Association Between Sleep and Chronic Medical Conditions

2003 National Sleep Foundation *Sleep in America* Survey (Foley D *et al.*, *J Psychosom Res* 2004.)

- 83% reported had at least one chronic medical condition, and 25% had 4 or more chronic medical conditions.
- Depression, heart disease, physical pain and memory loss were associated with symptoms of insomnia.
- Obesity, arthritis, diabetes, lung diseases, stroke and osteoporosis were associated with other sleep-related problems such as breathing pauses, snoring, daytime sleepiness, restless legs or insufficient sleep (<6 hrs/night).
IL-6 is an inflammatory cytokine associated with activation of the hypothalamic-pituitary-adrenal axis.

Elevated levels of circulating IL-6 are associated with increased daytime sleepiness and fatigue.

Amount and depth of sleep correlates negatively with daytime secretion of IL-6 (p<0.05)

Vgontzas AN et al., J Clin Endocrinol Metab 1999.
IL-6 and Sleep Quantity and Depth

- Sleep deprivation changed the temporal pattern of circadian IL-6 secretion but not the overall amount.
- Sleep-deprived individuals have daytime oversecretion and nighttime undersecretion of IL-6.

Vgontzas AN et al., J Clin Endocrinol Metab 1999.
IL-6 and Chronic Medical Conditions

- IL-6 is implicated in many chronic inflammatory conditions, including:
  - Congestive heart failure
  - Chronic obstructive lung disease
  - Osteoarthritis
  - Osteoporosis
  - Dementia

- Frailty: the “final common pathway” for aging
What is Frailty?

- **Fried**
  - “A state of age-related physiologic vulnerability resulting from impaired homeostatic reserve and a reduced capacity of the organism to withstand stress.”

- **Rockwood**
  - A precarious balance between homeostasis and stress that is easily perturbed

Sleep and Frailty

- FICSIT (Frailty and Injuries: Cooperative Studies of Intervention Techniques)

  Sleep disturbances are associated with poor health, limitations in ADLs, angina and depression in older men and women.
  

  Sleep disturbances are independently associated with depressive symptoms, bodily pain, history of falls, limited education and female gender.
  
  - Schechtman KB *et al., J Psychosom Res* 1997.
Sleep and Social Engagement

Women with good quality sleep and/or good social relationships appear to have low levels of IL-6.

IL-6 levels are elevated in women with poor quality sleep and poor social relationships.

Having either good quality sleep or good social relationships appears to compensate for difficulties with the other.

Friedman EM et al., PNAS 2005.
SLEEP
is good.
Why Are Sleep Disorders Underdiagnosed in Older Adults?

- Many of the typical sleep disturbances in older adults are thought to be normal consequences of aging.
  - Mazza M et al., Clin Ter 2004

- Lack of knowledge and of experience in diagnosing patients with sleep disorders.

- The average 4-year U.S. medical school curriculum devotes less than 2 hours of formal education to sleep.
  - [http://sleep.med.harvard.edu/what-we-do/medical-education](http://sleep.med.harvard.edu/what-we-do/medical-education)
Why Are Sleep Disorders Undertreated in Older Adults?

- See the previous slide.
- If sleep disturbances are “normal,” why would you treat them?
- If you don’t know how to diagnose a condition, how can you know how to treat it?
- If you never learned about sleep in medical school, why ask your patients about their sleep?
“Wired for Sleep”
www.kgh.on.ca/programs/sleep.asp
Ways Poor Sleep Affect Outcomes in Long-Term Care Residents

- Daytime sleepiness.
- Nighttime agitation.
- Increased risk for falls.
- Increased mortality.
- Dissatisfaction with nursing home care.
- Worsening functional status.
- Declining quality of life.
- Depression in assisted living facilities.
Ways Poor Sleep Affect Outcomes for Long-Term Care Facilities

- Worsening cognitive impairment.
- Increased falls.
- New fractures.
- Untreated depression.
- Unnecessary antipsychotic use.
- Little or no involvement in activities.
- Worsening quality indicators including Tag F329 (unnecessary drugs) and Tag F428 (medication regimen review).

www.managedhealthcareconnect.com
Risk Factors for Poor Sleep: Nursing Home Residents

- Number of noise and light changes.

- Incontinence care at night.
- Taking multiple medications.
- Certain chronic illnesses (e.g. dementia, CHF, COPD).

- Lack of daytime light exposure.

- Poor sleep habits prior to entering the nursing home.
  - Chronic insomnia (Yaffe K et al., *J Am Geriatr Soc* 2012)
Ways to Improve Sleep in Long-Term Care Residents

- Increased daytime physical activity and nighttime environment can improve sleep and lessen agitation in nursing home residents.

- Decreased daytime in-bed time, ≥30 minutes of daily sun exposure, increased physical activity, structured bedtime routine & decreased nighttime noise & light resulted in decreased daytime sleeping and increased participation in social & physical activities plus social conversation.
Ways to Improve Sleep in Long-Term Care Residents

- High-intensity strength training, walking & social activity helped improved sleep in assisted living and nursing home residents.
  - RCT conducted in 10 nursing home and 3 assisted living facilities

- Acupressure reduces nocturnal awakening and night wakeful time in institutionalized residents.
Do Herbals Help Improve Sleep Long-Term Care Residents?

- Mixed data, but most studies inconclusive or showed no effect on sleep for melatonin.

- However, melatonin failed to improve sleep or agitation in a double-blind randomized placebo-controlled trial of institutionalized patients with Alzheimer’s Disease.

- Valerian failed to improve sleep in older women with insomnia.
Sleep Aides in Long-Term Care: General Approach

- Non-pharmacologic interventions are safer and often, more effective.
  - Limit caffeine, promote daytime exercise, limit daytime naps, establish bedtime routine, limit nighttime awakening by nursing staff

- Tricyclic antidepressants.
  - Consider if resident is depressed and/or having neuropathy.

- Ramelteon.
  - Melatonin antagonist; may be more effective than melatonin.
Sleep Aides in Long-Term Care: General Approach

- **Z-Drugs** (e.g. zolpidem, zaleuton, eszopiclone)
  - Effective for insomnia, but increase risk for falls and delirium, especially in dementia patients.
  - Avoid benzodiazepines if possible.
  - Consider if patient has significant anxiety or agitation not responsive to other drugs.
  - Increased risk for falls and delirium.
  - Avoid diphenhydramine (Benadryl)
  - Beer’s list medication!
Sleep disorders are often seen in older adults.

Sleep disorders are associated with many of the geriatric syndromes.

Sleep is the aspect of lifestyle that perhaps is most often underrecognized as a contributing factor in chronic illness in elderly patients.

Sleep disorders are often underdiagnosed and undertreated in older adults.

Relatively simple, non-pharmacologic measures can improve sleep in long-term care settings.
QUESTIONS?
THANK YOU!
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