Effective Treatment of Sleep Disorders in Older Adults

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Presentation Objectives

• Provide an overview of the causes of sleep disturbance in older adults.
• Describe appropriate treatment strategies for these various causes.
Evidence-Based Recommendations for the Assessment and Management of Sleep Disorders in Older Persons

Bloom, Ahmed, Alessi, Ancoli-Israel, Buysse, Kryger, Phillips, Thorpy, Vitiello, and Zee

*Journal of the American Geriatrics Society* 57(5);561-589, 2009

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**Evidence-Based Recommendations**

- Background and Significance, General Review of Sleep, Recommendations Development, and General Approach to Detecting Sleep Disorders in an Ambulatory Setting.
- Insomnia, Sleep Apnea, Restless Legs Syndrome, Circadian Rhythm Sleep Disorders, Parasomnias and Hypersomnias,
- Sleep Disorders in Long-Term Care Settings.
- Evidence and expert-based recommendations.

Bloom et al. *JAGS* 2009
Sleep in Older Adults: Normative Changes, Sleep Disorders, and Treatment Options.

Nalaka S. Gooneratne and Michael V. Vitiello

Clinics in Geriatric Medicine 30(3):591-627, 2014

Gooneratne and Vitiello, 2014.

- Focuses on the 2 most common sleep disorders seen in older adults, insomnia and sleep-breathing disorders.
- Provides a much briefer discussion of several other sleep disorders, including restless legs syndrome (RLS), periodic limb movement disorder (PLMD), REM behavior disorder (RBD).
- Includes a symptom-based diagnostic algorithm for sleep complaints.
Causes of Sleep Disturbance in Aging

• Age-related sleep change
  • Changes in homeostatic sleep drive and circadian rhythm for wakefulness

• Co-morbid medical and psychiatric illnesses
  • E.g.; Pain, Depression, Alzheimer’s disease, etc.

• Primary sleep disorders
  • OSA, RLS, RBD, CRD, etc.

• Poor sleep hygiene
  • Learned behaviors, environmental factors, etc.

• Any combination of the above

Consequences of Sleep Disturbance

• Excessive, intrusive daytime sleepiness
• Increased risk of accidents and falls
• Impaired mood
• Impaired vigilance
• Impaired memory
• Impaired problem solving
Consequences of Sleep Disturbance

- Possible pathways to various illnesses:
  - Sleep apnea > Hypertension, CVD, Stroke
  - Sleep duration > Metabolic Syndrome > Diabetes
  - Insomnia > Depression, Alcohol Relapse, Pain

Age-Related Changes in Sleep Quality

- While epidemiological studies typically report that 40-50% of the elderly complain about significant and chronic sleep disturbance…
- It is important to remember that 50-60% of older adults do not complain.
- Yet the evidence is clear that the sleep of these non-complainers has changed significantly with advancing age.
Implications of Age-Related Sleep Changes

• If an older person complains of sleep problems but the only likely cause is age-related sleep change then education about what is normal sleep is crucial.

• “How fast can you run a 100 yard dash?”

Sleep Disturbance Co-morbid with Illness

• Both acute and chronic illnesses increase in frequency with age.
• Sleep may be adversely affected:
  – Directly by the illness per se.
  – Indirectly by consequences of and treatments for the illness:
    • Surgery/pain
    • Bed-rest/inactivity
    • Medications (Rx, OTC, other)
      – Dangers of polyphamacy.
Treating Sleep Disturbance
Co-morbid with Illness

• Previous wisdom – treat the illness and the “secondary” sleep disturbance will improve.
• Current wisdom is treat both the illness and the sleep disturbance, they are co-morbid.
• Effectively treating sleep may have beneficial impact on co-morbid illness:
  – Osteoarthritis and possibly other pain syndromes.
  – Depression, GAD.
  – Others illnesses, e.g.; hypertension (?).

Sleep Disturbance Resulting From Primary Sleep Disorders

• Sleep Disordered Breathing
  – Sleep Apnea
• Restless Legs Syndrome (RLS)
  – Periodic Leg Movements Disorder (PLMD)
• REM Behavior Disorder
• Irregular Sleep-Wake Rhythm (ISWR)
**Sleep Disordered Breathing**

- A.k.a. - Obstructive Sleep Apnea
- Age-related.
- Repeated stoppages or reductions in breathing during sleep.
- Typically caused by narrowing or collapse of the soft palate or pharynx.
- Repeated drops in blood oxygen saturation.
- Multiple brief awakenings / sleep fragmentation.
- Excessive daytime sleepiness.
- Impaired daytime function.

**Sleep Disordered Breathing**

- Sleep apnea, as defined by an apnea-hypopnea index 15 or more events per hour, meeting Medicare treatment guidelines, is present in up to 20% of older adults, with a markedly increased prevalence in certain conditions, such as congestive heart failure or dementia (approximately 50%–70%).
- A high index of suspicion is particularly important for the diagnosis of sleep apnea.
Sleep Disordered Breathing

- Treatment options:
  - Positional sleeping
  - Weight loss
  - Mandibular advancement devices (MADs)
  - Positive Airway Pressure (PAP)*
  - Surgery

Restless Legs Syndrome (RLS)

- Age-related.
- More common in women.
- Deep “pulling, searing, crawling or boring” sensations in the legs at rest.
- Typically occurs at bedtime.
- Typically relieved by movement.
- Delayed sleep onset.
- Excessive daytime sleepiness.
- Impaired daytime function.
**Restless Leg Syndrome (RLS)**

- Often occurs with Periodic Limb Movement Disorder (PLMD).
  - Which may be associated with multiple nighttime awakenings.
- Likely a metabolic disorder involving iron metabolism and dopamine.
- Treatment options:
  - Opiates and benzodiazepines have been used
    - Acetaminophen 300 mg with codeine 30 mg; Clonazepam 0.5-2.0mg.
  - Dopaminergics are the treatment of choice.
    - Ropinerole 0.25-1.5 mg; Pramipexole 0.125-1.5 mg.

**REM Behavior Disorder**

- Age-related.
- More common in men.
- Absence of normal REM atonia.
  - The loss of skeletal muscle tone that occurs during REM
- Permits “acting out” of dreams.
- Commonly results in violent actions
  - Potentially dangerous to the individual and the bed partner.
REM Behavior Disorder

- Acute form follows ETOH withdrawal, sedative abuse and drug-intoxication.
- May be an early manifestation of PD.
- Treatment of choice is clonazepam.
  - Pre-bedtime 0.25-4.0 mg
- Controls both behavioral and dream components of the disorder.
- Effective immediately for both acute and chronic RBD.

Irregular Sleep-Wake Rhythm

- Relative lack of circadian pattern to the sleep-wake cycle. Randomly distributed sleep bouts.
- Poor sleep habits, environmental conditions, social and physical activity schedules may be contributing factors.
- Associated with neurological and medical conditions, e.g.; Alzheimer’s disease.
- Damage to the circadian pacemaker is implicated.
- Timed light exposure and mixed modal therapies are effective treatment approaches.
Causes and Treatment Strategies

• Some sleep changes are a normal part of aging and education is key to effective treatment.
• If a sleep disturbance is co-morbid with an illness treat both the illness and the sleep disturbance directly.
• If a primary sleep disorder is the cause of the sleep disturbance it should be treated directly.

Other Treatments Strategies

• Situations where a sleep disturbance is not wholly the result of age-related sleep change, health burden etc. or a primary sleep disorder are common.
  – Sleep disruption is likely to be maintained by the development of poor sleep habits and conditioned emotional responses, i.e., learning.
  – Such disturbances may or may not occur co-morbid with other illnesses
DSM-V Criteria for Insomnia Disorder

A. A predominant complaint of dissatisfaction with sleep quantity or quality, accompanied by one (or more) of the following symptoms:
   • Difficulty initiating sleep
   • Difficulty maintaining sleep characterized by frequent awakenings or problems returning to sleep after awakening
   • Early morning awakening with inability to return to sleep

B. The sleep difficulty causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.

C. The sleep difficulty occurs at least 3 nights per week.

D. The sleep difficulty is present for at least 3 months.

E. The sleep difficulty occurs despite adequate opportunity for sleep.
**DSM-V Criteria for Insomnia Disorder**

F. The sleep difficulty is not better explained by and does not occur exclusively during the course of another sleep-wake disorder.

G. The sleep disorder is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication).

H. Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia.

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**Chronic Insomnia Treatment Strategy**

- **First** - Useful in almost all cases - a careful review and optimizing of a patient’s sleep hygiene/habits practices.
- **Second** - Use of more formal cognitive-behavioral interventions as appropriate.
- **Third** - Judicious use of appropriate hypnotics in association with cognitive- behavioral techniques or alone may be helpful.

NIH State-of-the-Science Conference Statement *Sleep* 2005
Sleep Education

- Accurate, fact-based information about sleep, for example:
  - What is normal sleep for a given age.
  - What are the consequences of mild sleep loss.
- Addresses erroneous assumptions, misperceptions and dysfunctional beliefs about sleep.
Sleep Hygiene/Habits

• The behavioral and environmental factors, typically under the individual’s control, that can maximize or compromise sleep quality.
  – Sleep/Wake Principles.
  – Environmental Principles.
  – Diet and Drug Use Principles.
  – General Principles.

Sleep/Wake Principles

• Maintain habitual bed and rise times.
  • In particular, get up at the same time each day.

• Restrict time in bed.
  • Stay in bed only as long as you are asleep.

• Explore the usefulness of napping.
  • Remember that daytime naps may decrease nighttime sleep need.
    – Although two recent studies suggest this may not be the case in healthy older adults: Monk et al, Sleep, 2001; Campbell et al, JAGS, 2005
Environmental Principles

• Ensure the bedroom is sufficiently dark.
• Minimize disturbing noise.
• Ensure bedding, temperature and airflow are consistent with good quality sleep.
• Ensure a nightlight does not illuminate the eyes while in bed.
• Eliminate or place bedroom clocks so that they can not be viewed from bed.

Diet and Drug Use Principles

• Avoid rich food late in the evening.
• Explore the usefulness of a light bedtime snack.
  – Try snacking on foods that promote sleep:
    • E.g., milk, bananas, turkey, cheese, peanut butter.
• Avoid caffeine, alcohol and tobacco.
• Be aware that OTC and prescription medications may adversely affect sleep.
**General Principles**

- Know what normal, age appropriate, sleep patterns should be.
- Explore if bedroom habits disrupt sleep.
- Develop relaxing bedtime rituals.
- Schedule a regular “worry time”.
- Exercise regularly and moderately.
- Spend time outdoors in natural sunlight.
- Avoid bright light during the night.

**Pharmacological Treatment Approaches**

- Benzodiazepines
  - E.g.; Temazepam (*Restoril*), Triazolam (*Halcion*)
- Benzodiazepine Receptor Agonists (BZRAs)
  - Zaleplon (*Sonata*)
  - Zolpidem (*Ambien, Ambien-CR*)
  - Eszopiclone (*Lunesta*"
- Melatonin Agonists
  - Ramelteon (*Rozerem*"

Sleep (Vitiello), NW GWEC Winter 2016
### Pharmacological Treatment Approaches

- **Antidepressants**
  - Doxepin (*Silenor*)

- **Orexin/Hypocretin Antagonists**
  - Suvorexant (*Belsomra*)

- **Others agents currently available or in development:**
  - OTC - Melatonin, valerian, anti-histamines, etc.
  - Prescription - Anti-depressants, anti-psychotics, etc.
  - In development – 5HT, GABA and Hypocretin/Orexin.

### Caveats Concerning Drug Treatment

- The BZRAs are efficacious:
  - Good safety profiles but not without side-effects:
    - Residual daytime sedation, cognitive and psychomotor impairment, dependence, and rebound insomnia.
  - Reasonably demonstrated intermediate-term safety and efficacy.
  - Long-term safety and efficacy remain to be demonstrated.

- Melatonin agonists appear to be safe and fairly efficacious for sleep onset difficulties, but are relatively new and lack extensive data.

NIH State-of-the-Science Conference Statement *Sleep* 2005
**Caveats Concerning Drug Treatment**

- Is the insomnia transient or chronic?
- What is the nature of the sleep complaint?
- Does the drug’s profile of action match the patient’s complaint?
- What are the drug’s likely side-effects?
  - Psychomotor impairment
  - Cognitive Impairment
  - Daytime carryover sedation
  - Respiratory depression
  - Rebound insomnia

**Cognitive-Behavioral Therapy for Insomnia (CBT-I)**

- Cognitive-Behavioral Therapy for Insomnia (CBT-I):
  - Sleep Hygiene/Habits
  - Sleep Logging
  - Stimulus Control Therapy (SCT)*
  - Sleep Restriction Therapy (SRT)*
- CBT-I may also include:
  - Relaxation Techniques
  - Cognitive Restructuring
Relative Efficacy of Cognitive-Behavioral and Pharmacological Therapies

Morin et al. 1994; Murtagh and Greenwood 1995; Nowell et al. 1997; Smith et al. 2002

Stimulus Control Therapy

- Develop a pre-bed ritual and ensure the bedroom is comfortable.
- Maintain a consistent rise time.
- Go to bed only when sleepy.
- If unable to fall asleep, leave the bedroom and return only when sleepy.
- Use the bedroom only for sleep and sex and avoid activities such as watching television or working while in bed.
- No daytime naps.

Bootzin et al. Progress in Behavior Modification 1978
**Sleep Restriction Therapy**

- Determine average time asleep.
- Set time in bed = time asleep.
- Maintain a consistent wake-up time.
- No daytime naps.
- If time asleep $\geq 90\%$ (85\%) of time in bed then increase time in bed (~15 minutes).
- If time asleep < 80\% of time in bed then decrease time in bed (~15 minutes).

*Spielman et al. Sleep 1987*

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**Cognitive Behavioral Therapy**

- CBT-I compared with pharmacotherapy for late-life insomnia:
  - CBT and pharmacotherapy were both effective and comparable in the short term.
  - CBT was rated more effective than drug therapy by subjects, significant others and clinicians.
  - Sleep improvements were better sustained by CBT over a two year follow-up period.

Cognitive Behavioral Therapy

- CBT-I can successfully improve the sleep of chronic hypnotic users, resulting in discontinuation of drug use at a significant health care cost savings:
  - One time £155/patient cost of CBT-I training versus cost savings of £3400/patient/yr.


- 20 studies (1162 participants).
- SOL improved by 19.03 minutes, WASO improved by 26.00 minutes, TST improved by 7.61 minutes, and SE improved by 9.91%
- Changes were sustained at later time points.
- No adverse outcomes were reported.
- CBT-i is an effective treatment for adults with chronic insomnia, with clinically meaningful effect sizes.
Cognitive Behavioral Therapy

CBT-I improves co-morbid insomnia in:

– Common age-related co-morbidities

– Osteoarthritis*

– Mixed psychiatric conditions

– Cancer

Cognitive Behavioral Therapy

CBT-I improves co-morbid insomnia in:

– Major depression

– General primary care patients

– Mixed medical co-morbidities

– Alzheimer’s disease

- 23 studies (1379 patients).
- CBT-I improved subjective sleep quality post-treatment, with large treatment effects.
- Sleep diaries showed a 20 min reduction in SOL and WASO, 17 min improvement in TST, and 9% improvement in sleep efficiency.
- Treatment effects were durable up to 18 mo.
- CBT-I is an effective, durable treatment for comorbid insomnia.


- 37 studies (2189 patients).
- Effect sizes were medium to large for most sleep parameters.
- Comorbid outcomes yielded smaller effect sizes.
- CBT-I is efficacious for improving insomnia for patients with comorbid insomnia.
- A small-medium effects were found across comorbid outcomes, with larger effects on psychiatric conditions compared with medical conditions.
The Take-home Messages

• Sleep disturbances in aging commonly result from multiple causes.

• Sleep may be significantly disturbed even in healthy “optimally-aging” elderly, but often does not result in complaint.

• Education is frequently helpful.

• Never assume that a sleep complaint in an older adult is “merely” the result of getting older, as it typically is not.

The Take-home Messages

• Sleep disturbance co-morbid with health burden - treat both the illness and the sleep disturbance.

• Sleep disturbed by a primary sleep disorder - treat the sleep disorder directly.

• In almost all cases of sleep disturbance and especially those with no discernible cause optimize sleep hygiene and consider CBT-I.

• Judicious use of sleeping pills may be helpful, but should not be the first course of action.
The Take-home Messages

• Effectively treating sleep disturbance may have beneficial impact on co-morbid illness (e.g.; pain syndromes, depression).
• There are effective treatments for most of the sleep disturbances seen in older adults.
• Accurate differential diagnosis and appropriate and iterative treatment are essential to effective treatment.

The Take-Home Messages

Growing older does not mean sleeping poorly!
Web Resources

http://www.sleepeducation.com/
http://www.aasmnet.org/
http://www.sleepfoundation.org/
http://www.cbtforinsomnia.com/