Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

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Symposium Panel

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Symposium Agenda

- Background on aging and sleep disturbance (Zee)
- Current state of OTC therapeutics for sleep disturbance (Vitiello)
- Pharmacist perspective on OTC sleep aids: gaps in therapies and clinical practice (Toscani)
- Discussant review (Bliwise, Ancoli-Israel)
- Questions

Objectives

- Increase understanding of sleep health and OTC sleep aid use in older adults (ages 65 years and older)
- Identify opportunities for promoting safe and effective use of OTC sleep aids among older adults
Population-Based Estimates of Poor Sleep Health: BRFSS 2006

![Graph A: SLEEPDIST]

![Graph B: TIRENESS]

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Understanding Older Drivers: An Examination of Medical Conditions, Medication Use, and Travel Behavior

April 2014

Tables 5 and 6 taken together suggest that a substantial number of older people are taking over-the-counter medications. The extent to which purchasers ask a pharmacist or their own physicians about the impacts of non-prescription medications is unknown. But an AAA FTS report (2009) found that many drivers were unaware of the risks of most medications; moreover, doctors and other medical professionals rarely warned drivers about these risks.
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Table 2. Self-Report of Effectiveness of Each Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Perceived Effectiveness, Mean ± Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription sleeping medicine</td>
<td>2.5 ± 1.2</td>
</tr>
<tr>
<td>Change room</td>
<td>2.1 ± 1.2</td>
</tr>
<tr>
<td>Read</td>
<td>2.0 ± 1.2</td>
</tr>
<tr>
<td>Radio or television</td>
<td>2.0 ± 1.1</td>
</tr>
<tr>
<td>Change room temperature</td>
<td>2.0 ± 1.1</td>
</tr>
<tr>
<td>Over-the-counter sleep medicine</td>
<td>1.9 ± 1.3</td>
</tr>
<tr>
<td>Took a nap the next day</td>
<td>1.9 ± 1.1</td>
</tr>
<tr>
<td>Took medicine for pain</td>
<td>1.9 ± 1.1</td>
</tr>
<tr>
<td>Bath or massage</td>
<td>1.8 ± 1.2</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.8 ± 1.0</td>
</tr>
<tr>
<td>Spoke to someone</td>
<td>1.8 ± 1.2</td>
</tr>
<tr>
<td>Exercise</td>
<td>1.7 ± 1.2</td>
</tr>
<tr>
<td>Snack</td>
<td>1.7 ± 1.1</td>
</tr>
<tr>
<td>Drink liquid other than alcohol</td>
<td>1.6 ± 1.0</td>
</tr>
<tr>
<td>Relaxation exercises</td>
<td>1.5 ± 1.2</td>
</tr>
<tr>
<td>Cigarette</td>
<td>1.3 ± 1.6</td>
</tr>
<tr>
<td>Muscle relaxin</td>
<td>1.3 ± 1.3</td>
</tr>
<tr>
<td>Vitamins</td>
<td>1.3 ± 1.3</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>1.3 ± 1.5</td>
</tr>
<tr>
<td>Refrained from taking a nap the next day</td>
<td>1.2 ± 1.2</td>
</tr>
<tr>
<td>Ear plugs</td>
<td>1.0 ± 1.0</td>
</tr>
</tbody>
</table>

Perceived Effectiveness of Diverse Sleep Treatments in Older Adults


Sleep Diary – May 2006

In bed at 7:45 PM
Asleep at 9:45 PM
E evacate at 11:00 PM
Sleep
Asleep at 11:30 PM
A sleep at 4:30 AM
Asleep at 4:15 AM
A sleep at 5:30 AM
Sleep at 5:30 AM
Asleep at 5:30 AM

0-4=maximum effectiveness; n=242; mean age 73 years
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

2013 International Bedroom Poll
Summary of Findings

United States
Average time slept work nights: 6h 31m
Average sleep needed to function best: 7h 13m
Less sleep than needed on workdays: 56%
Good night sleep every/ almost every night: 44%
Schedule/Routine allows adequate sleep: 72%

Canada
Average time slept work nights: 7h 3m
Average sleep needed to function best: 7h 22m
Less sleep than needed on workdays: 53%
Good night sleep every/ almost every night: 43%
Schedule/Routine allows adequate sleep: 70%

Mexico
Average time slept work nights: 7h 6m
Average sleep needed to function best: 8h 15m
Less sleep than needed on workdays: 40%
Good night sleep every/ almost every night: 40%
Schedule/Routine allows adequate sleep: 66%

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Sleep Health Among Older Adults: Many Unknowns

- Prevalence of sleep disturbance (vs. insomnia)
  - Relation to age, medical status, daily environment
- How older adults use OTC products to treat sleep disturbance
  - Relative to Rx and non-pharmacologic therapies
- Efficacy of OTC therapies
- Role of pharmacists in counseling and product choice

Background on Aging and Sleep Disturbance

Phyllis Zee, MD, PhD, Northwestern University Feinberg School of Medicine

Sleep, Circadian Rhythms, and Health

Sleep disorders
- Insomnia
- Sleep apnea
- Restless legs
- Narcolepsy

Aging
- Genetic predisposition
- Circadian disruption
- Behavioral lifestyle
- Work schedules
- Physical activity level

Sleep Deficiency Circadian Dysfunction

Obesity
- Diabetes
- Heart disease
- Lung disease
- Mood disorders
- Neurologic disorders

Cognitive performance

### Effects of Aging on Sleep

### Effects of Sleep (Poor) on Aging

### Similarities Between Sleep Loss and Aging

<table>
<thead>
<tr>
<th>Function</th>
<th>Sleep Loss</th>
<th>Aging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose tolerance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulin sensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-reactive protein</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac sympathetic activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma norepinephrine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening cortisol levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma TSH levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma leptin levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vigilance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective alertness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive function</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

GSA 2014 Annual Scientific Meeting
Reported Sleep Problems: Survey

(n = 9,282; mean age 74 years)

- Waking Not Rested
- Waking Too Early
- Trouble Falling Asleep
- Daytime Napping
- Insomnia
- Nocturnal Waking
- Initiating/Maintenance

Percent


Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Duration of Insomnia in the National Comorbidity Survey Replication

n = 2,578


Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults
GSA 2014 Annual Scientific Meeting
Prevalence of Sleep Disturbance in Persons with Dementia and Their Family Caregivers

<table>
<thead>
<tr>
<th>Caregivers</th>
<th>Persons with Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCurry and Teri</td>
<td>68%</td>
</tr>
<tr>
<td>Pruchno and Potashnik</td>
<td>22–41% (men), 53–67% (women)</td>
</tr>
<tr>
<td>Wilcox and King</td>
<td>67% (women only)</td>
</tr>
</tbody>
</table>

| Carpenter et al.            | 40%                   |
| Craig et al.                | 42–54%                |
| Lyketsos et al.             | 20–27%                |
| McCurry et al.              | 35%                   |
| Moran et al.                | 25%                   |
| Pang, et al.                | 35–54%                |
| Rabins                      | 33%                   |
| Ritchie                     | 19–44%                |
| Thommessen et al.           | 25%                   |


Sleep: A Marker of Physical and Mental Health

- Odds ratio (OR) of physical or mental health (determined with SF-12) contributing to a sleep complaint


n = 1,503; age 60-100 years
All significant at P<0.001
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Possible Underlying Causes of Sleep Disturbance and Insomnia Symptoms

- Altered Sleep Regulation & Circadian Rhythms
- Medical, Neurologic, & Psychiatric Conditions
- Psychosocial Factors
- Difficulty Initiating & Maintaining Sleep
- Chronic Pain Pulmonary Disease
- Depression
- SDB (Sleep Apnea) Restless Legs
- Late-Life Stressors


Insomnia With Short Sleep Duration Is Associated With Health Outcomes

<table>
<thead>
<tr>
<th>Health Condition</th>
<th>Associated With…</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sleep Duration</td>
</tr>
<tr>
<td>Hypertension1</td>
<td>Yes (≤ 6 hours)</td>
</tr>
<tr>
<td>Type 2 diabetes2</td>
<td>No</td>
</tr>
<tr>
<td>Neuropsychological test performance3</td>
<td>Yes (≤ 6 hours)</td>
</tr>
<tr>
<td></td>
<td>5/14 tests</td>
</tr>
<tr>
<td>Mortality4</td>
<td>No</td>
</tr>
<tr>
<td>Cortisol5</td>
<td>No</td>
</tr>
</tbody>
</table>

Normal age-associated changes in sleep are

**NOT**

primarily responsible for increased prevalence of insomnia and other sleep disorders in older adults

Highest contribution is physical and mental health
Impact of Poor Sleep in Elderly Adults

- Difficulty Sustaining Attention & Slowed Response Time
- Decreased Ability to Accomplish Daily Tasks
- Impairments in Memory & Concentration
- Increased Consumption of Health Care Resources
- Increased Risk of Falls
- Shorter Survival
- Inability to Enjoy Social Relationships
- Increased Incidence of Pain


Cognitive Decline and Insomnia in Older Adults

- OR for decline for men with chronic insomnia without depression = 1.48; with depression = 2.18
- Adjusted for baseline cognitive function, age, race, education, income, and marital status

Summary of Study of Osteoporotic Fractures Study Results (n=3,022)

- A 30-40% increased risk of subsequent falls associated in older women with
  - TST< 7 hours / night
  - SE ≤ 65%
- An increased mortality risk in older women with
  - TST< 5 hours / night
  - SE ≤ 65%
  - >2 hour naps

After adjusting for race, age, BMI, medical conditions, depression, cognitive function, exercise, IADL, use of anti-depressant or benzodiazepine


Impact of Insomnia on Quality of Life

Axes represent subscales of the SF-36. All P values < .05 (range .000-.023).

Insomnia is under-reported and under-recognized

- 69% - Never discussed
- 26% - Discussed sleep during visit for other purpose
- 5% - Visited specifically to discuss sleep problem

Ancoli-Israel S, Roth T. Sleep. 1999;22(suppl 2):S347-S353

- Number of Sleep Complaints Endorsed (n=1503, age 60-100 years)
  - 69% endorsed at least one sleep problem
  - 40% endorsed >2 sleep problems
  - 45% endorsed symptoms of insomnia
  - BUT identified in medical chart only 19% of time


Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Conclusions

- Although sleep patterns change with age, it is the change in the ability to sleep and co-morbid medical and psychiatric disorders that result in most sleep complaints in older adults
- Sleep — similar to nutrition and physical activity — is an essential part of a healthy lifestyle for all
- A potentially modifiable risk factor for age-associated impairments in mental and physical function
Current State of OTC Therapeutics for Sleep Disturbance

Types of Sleep Aids

- Prescription drugs
- Herbals and supplements
- Alcohol
- OTC drugs
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

**Prescription Drugs**

- Prescription sleep aids:
  - Eszopiclone (Lunesta)
  - Ramelteon (Rozerem)
  - Doxepin (Silenor)
- FDA approved for treatment of insomnia
- DSM-V diagnosis of insomnia disorder requires disturbed sleep 3 or more nights/week for a month
- No limitation on treatment duration

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**Herbals and Supplements**

- Valerian, chamomile, melatonin, etc.
- FDA has updated the labeling laws so consumers can see herbals’ actions in the body
- Herbal labels still cannot say anything about treating specific medical conditions because they are not subject to clinical trials or to the same standards as prescription or OTC drugs
- Example labeling statement: “to promote regular sleep patterns”
Alcohol

• Frequently used as a sleep aid
• Sedative effects may lead to shortening of sleep latency
• Alcohol disrupts nighttime sleep quality and compromises nighttime respiration
• May result in residual daytime effects

OTC Agents

• Doxylamine, diphenhydramine
• FDA approved
• Not for treatment of insomnia
• Indicated for occasional sleeplessness of 2 to 3 nights
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

US FDA Permitted OTC Sleep Aids

- Doxylamine
  - Unisom SleepTabs, Equaline Sleep Aid, Good Sense Sleep Aid, etc.
  - Very weak H1 antagonist; H1/M1 potency ratio low to moderate
  - Pregnancy Category B
  - No published placebo-controlled trials supporting efficacy in older adults


US FDA Permitted OTC Sleep Aids

- Diphenhydramine
  - Nytol, Sominex, TYLENOL PM, Excedrin PM, Advil PM, Unisom SleepGels, ZzzQuil, etc.
  - Very weak H1 antagonist; H1/M1 potency ratio low to moderate
  - Pregnancy Category B
  - 1 published crossover study in 20 older insomniacs:
    - Decreased only awakenings vs placebo; AEs vs placebo: dry mouth (80 vs 65%), dizziness (25 vs 10%), and headache (20 vs 5%)
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

### Diphenhydramine Specificity of Action

![Graph showing the specificity of action of diphenhydramine compared to other receptors](image)


### Longest Period of OTC and Prescription Sleep Aid Use

![Bar graph showing the longest period of OTC and prescription sleep aid use](image)

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Number of Days in Last Month

<table>
<thead>
<tr>
<th>Age</th>
<th>&lt;1</th>
<th>1-4</th>
<th>5-19</th>
<th>20+</th>
</tr>
</thead>
<tbody>
<tr>
<td>60+</td>
<td>9.1%</td>
<td>24.1%</td>
<td>31.2%</td>
<td>35.6%</td>
</tr>
<tr>
<td>65+</td>
<td>8.3%</td>
<td>24.7%</td>
<td>31.4%</td>
<td>35.6%</td>
</tr>
<tr>
<td>75+</td>
<td>7.4%</td>
<td>19.3%</td>
<td>31.6%</td>
<td>41.7%</td>
</tr>
</tbody>
</table>

Base: Experiencing sleep difficulties, reporting one or more symptoms of sleeplessness, and use OTC for sleep difficulties
NHWS US 2012: (SQ6) Thinking of the sleeplessness or difficulty sleeping that you experience, which of the following sleep problems or symptoms do you regularly experience?
NHWS US 2012: (HH10) Which of the following have you experienced in the past 12 months? <Sleep difficulties>
NHWS US 2012: (SD75) Do you use an over-the-counter or herbal products to treat your sleep condition?
NHWS US 2012: (SD90) How many days did you use the following product(s) in the past month?

Diphenhydramine Pharmacokinetics and Age


Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults
Residual Effect of Diphenhydramine 50 mg on PET

FIGURE 1. Images of BPR of [11]C-doxepin in the human brain. The BPR images taken from healthy male subjects (n = 8) using PET 12 hours after oral diphenhydramine 50 mg (left), bepotastine 10 mg (middle), or placebo (right) administration, and their MRI-T1 images (far right) are shown in the transaxial (top), coronal (middle), and sagittal (bottom) sections for each treatment. White circles indicate the ROIs. The brain image of each subject was transformed to fit stereotactic brain space (spatial normalization) and was averaged across each treatment to generate the mean images. Note that treatment with diphenhydramine results in significantly lower BPRs than the other 2 treatments.


Residual Sedation of Diphenhydramine 50 mg

TABLE 4. TESTS OF NEUROLOGIC FUNCTION

<table>
<thead>
<tr>
<th>Neurologic Test</th>
<th>Temazepam vs. Placebo</th>
<th>DPH vs. Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word list</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Tapping board</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Cancellation test—time</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Cancellation test—omissions</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Digit span forward</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Digit span reverse</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Digit symbol substitution</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Plus sign indicates better score on test during week when the agent was administered.


Beers Criteria

TABLE 1. 2012 AGS BEERS CRITERIA FOR POTENTIALLY INAPPROPRIATE MEDICATION USE IN OLDER ADULTS

<table>
<thead>
<tr>
<th>Organ System/Therapeutic Category/Dose(s)</th>
<th>Recommendation, Rational: Quality of Evidence (QE) &amp; Strength of Recommendation (SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticholinergic (excl. TCA)</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
<tr>
<td>First generation antihistamines (as single agent or as part of combination products)</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
<tr>
<td>Diphenhydramine (small)</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
<tr>
<td>Doxylamine</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
<tr>
<td>Hydroxyzine</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
<tr>
<td>Promethazine</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
<tr>
<td>Trihexyphenidyl</td>
<td>Avoid. Highly anticholinergic clearance reduced with advanced age, and tolerance develops when used as hypnotics. Increased risk of confusion, dry mouth, constipation, and other anticholinergic effects/benefits. Use of diphenhydramine in special situations such as acute treatment of severe allergic reaction may be appropriate. GE = High (Titratable and Promethazine). Moderate (Tolterodine): SR = Strong.</td>
</tr>
</tbody>
</table>

Conclusions

- Efficacy data for OTC sleep aids in general are not available and there are almost none for older adults
- Many older adults misuse OTC sleep aids, taking them for long periods of time
- Duration of action of diphenhydramine increases with age
- Safety concerns relate to potential residual effects and anticholinergic side effects
Review of Today’s Pharmaceutical Care

- Increase access to health care for consumers/patients
- Provide advice/direction
- Provide education/information
- Coordinate essential health information
- Manage/coordinate OTC sleep aid use with prescription medication dispensing and other pharmacist-provided patient care services
- Perform patient triage and make referrals

2013 Pharmacy Today
Over-the-Counter Product Survey

- Pharmacists make an average of 28 OTC product recommendations per week and counsel 27 patients
- On average, 77% of patients purchase the OTC product recommended by the pharmacist
- On average, pharmacists spend 3.6 minutes with patients requesting OTC information
- After counseling patients on OTC products, most pharmacists refer them to another health care professional – Refer 73% of the time

**OTC Sleep Recommendations: Pharmacy Today Survey**

**Sleep Aids (n = 1,256)**
- Unisom SleepTabs (doxylamine): 22%
- Unisom SleepGels (diphenhydramine): 21%
- ZzzQuil (diphenhydramine): 7%
- Nytol (diphenhydramine): 6%
- Sominex (diphenhydramine): 5%
- MidNite (herbal): 2%
- Other: 38%


**Clinical Assessment of Sleep Health**

Assessment of sleep health and use of OTC sleep medications should be part of the routine examination in all patients

- **How many hours of sleep do you get, on average?**
- **Do you have problems falling asleep or staying asleep?** How often?
- **Do you feel sleepy, drowsy, or tired during the day?**
- **Do you take OTC medications to help you sleep?**

**It takes less than 1 minute!**

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Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

GSA 2014 Annual Scientific Meeting
## Investigate Causes of Sleep Disturbances/Insomnia

- Transient 1 wk; Short term 1-3 wks; Chronic more than 3 wks
- Difficulty falling asleep (life stresses, medical illness, anxiety, poor sleep habits)
- Environmental (late night exercise, meals, new surroundings, etc.)
- Caffeine, alcohol
- Medical conditions (pain, GERD, asthma, etc.)
- Medications (Rx and OTC)
- Shift work
- Circadian rhythm disorders: children/adolescents

Dlugosz CK. Practitioner’s Quick Reference to Nonprescription Drugs. 2nd ed. 2012; p 233-249.

## Insomnia Guidance: Handbook of Nonprescription Drugs

Dlugosz CK. Practitioner’s Quick Reference to Nonprescription Drugs. 2nd ed. 2012; p 233-249.
Exclusions for Self-Treatment

- <12 years of age
- ≥65 years of age
- Pregnancy
- Frequent nocturnal awakenings or early morning awakenings
- Chronic insomnia (>3 weeks)
- Sleep disturbance secondary to psychiatric or general medical disorders

Dlugosz CK. Practitioner’s Quick Reference to Nonprescription Drugs. 2nd ed. 2012; p 233-249.

Therapeutic Options for Occasional Sleeplessness

- Sleep hygiene practices
- Complementary therapy
  – Melatonin, valerian, others
- Pharmacologic therapy (OTC sleep aids)
  – Diphenhydramine/doxylamine products
  – Combination products with analgesics
Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Project Objective

• To investigate self-reported sleeplessness symptoms and problems among adults (18+ years of age) in the United States, using data from Kantar Health’s National Health and Wellness Survey (NHWS)

NHWS Method and Sample

• Data collection
  – Survey administered via the Internet since 2002
  – Data collected during Q1–Q3 2013
• Sample
  – Adults 18+ years of age
  – Sample drawn from the Internet panel maintained by Lightspeed Research and its partners
  – Invitations to participate sent to a sample stratified according to:
    • Gender
    • Age
    • Race
• Results are projected to reflect the total population using known population incidences for key subgroups
  – Weighting variables: gender, age, race/ethnicity, and education
  – From 2012 Current Population Survey (Annual Demographics File) of the U.S. Census Bureau
Sleeplessness Symptoms Reported by Survey Respondents

- Self-report regularly experiencing 1 or more sleeplessness symptoms including:
  - Difficulty falling asleep
  - Waking during the night and not being able to get back to sleep
  - Waking up several times during the night
  - Waking up too early (such as before the alarm clock)
  - Poor quality of sleep
- Self-report experiencing or diagnosis of “sleep difficulties” and/or “insomnia” (past 12 months)
- Self-report no sleeplessness symptoms, but do report experiencing or diagnosis of “sleep difficulties” and/or “insomnia”
- Self-report no sleeplessness symptoms nor any type of “sleep difficulties”/“insomnia”
- Respondents who report narcolepsy, parasomnia, sleep-disordered breathing/sleep apnea, and/or circadian rhythm disorder excluded from analysis

NHWS Study Population: Sleep Medication Sub-Study

![Flowchart](image)
Population With Sleeplessness Symptoms

- 49% of adults report sleeplessness symptoms
- Among those reporting sleeplessness symptoms:
  - 45% report experiencing or diagnosed sleep difficulties/insomnia
  - 55% report no experience of sleep difficulties
  - 33% report daytime sleepiness symptoms

Sleeplessness Symptoms Among Adults Reporting Sleep Difficulties/Insomnia

<table>
<thead>
<tr>
<th>Percentage Reporting Symptoms by Age in Years</th>
<th>18+</th>
<th>18-64</th>
<th>65-74</th>
<th>75+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty falling asleep</td>
<td>73%</td>
<td>74%</td>
<td>65%</td>
<td>62%</td>
</tr>
<tr>
<td>Waking during the night</td>
<td>54%</td>
<td>52%</td>
<td>63%</td>
<td>63%</td>
</tr>
<tr>
<td>Waking up several times</td>
<td>51%</td>
<td>51%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Waking up too early</td>
<td>41%</td>
<td>41%</td>
<td>39%</td>
<td>38%</td>
</tr>
<tr>
<td>Poor quality of sleep</td>
<td>45%</td>
<td>48%</td>
<td>28%</td>
<td>26%</td>
</tr>
</tbody>
</table>
Current Rx Use Among Adults 65+ With Sleep Difficulties/Insomnia

Use Rx 1.8 M (25%) (n=2,434)

Age 65+ 6.3 M (12%) (n=2,434)

No Rx 4.8 M (75%) (n=1,819)

Age 18-65 4.6 M (4%) (n=1,201)

Top 10 Rx Therapies Used

- Ambien (zolpidem) 558 K 36% (n=212)
- Trazodone hydrochloride 180 K 12% (n=77)
- Keppra (levetiracetam) 113 K 7% (n=44)
- Amitriptyline (amitriptyline) 85 K 6% (n=30)
- Temazepam (temazepam) 84 K 5% (n=31)
- Lunesta (eszopiclone) 70 K 5% (n=31)
- Ambien CR (zolpidem tartrate) 62 K 4% (n=23)
- Restoril (temazepam) 60 K 4% (n=22)
- Lorazepam (lorazepam) 50 K 3% (n=21)
- Zolpimist (zolpidem tartrate) 50 K 3% (n=21)

Results from Kantar Health’s National Health and Wellness Survey (NHWS): US 2013

Questions reference for this slide include: DE10, HH10, HH15, HH20, SD35, SD75, SD80

Current OTC/Herbal Product Use Among Adults 65+ With Sleep Difficulties/Insomnia

Use OTC/herbal product 2.3 M (37%) (n=905)

Age 65+ 6.3 M (12%) (n=2,434)

No OTC/herbal product 4.0 M (63%) (n=1,529)

Age 18-65 4.6 M (38%) (n=1,201)

Top 10 OTC/herbal Products Used

- Melatonin 782 K 34% (n=296)
- Tylenol Products* 447 K 19% (n=165)
- Benadryl/Diphenhydramine* 270 K 12% (n=107)
- Sleep Aid 204 K 9% (n=77)
- Advil PM* 163 K 7% (n=61)
- Valerian 109 K 5% (n=51)
- ZzzQuil* 93 K 4% (n=36)
- Unisom 75 K 3% (n=25)
- Midnite 75 K 3% (n=23)

*Contains diphenhydramine or doxylamine

Results from Kantar Health’s National Health and Wellness Survey (NHWS): US 2013

Questions reference for this slide include: DE10, HH10, HH15, HH20, SD75, SD80

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

GSA 2014 Annual Scientific Meeting
Sleep Treatment Combinations

| Percentage of Adults Reporting Sleep Difficulties/Insomnia by Age in Years |
|---|---|---|
| 18-64 | 65-74 | 75+ |
| Rx Only | 15% | 21% | 17% |
| OTC Only | 12% | 12% | 12% |
| Herbal Only | 10% | 9% | 12% |
| Rx + OTC | 2% | 2% | 3% |
| Rx + Herbal | 2% | 2% | 2% |
| OTC + Herbal | 3% | 3% | 3% |
| Rx + OTC + Herbal | ~1% | ~1% | ~1% |
| No Product | 54% | 49% | 51% |

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

Drug Facts Label: Diphenhydramine

Sleep Health and the Appropriate Use of OTC Sleep Aids in Older Adults

GSA 2014 Annual Scientific Meeting
### Days Using OTCs Among Adults Taking DPH/DOX

#### Days per Month

<table>
<thead>
<tr>
<th>Days per Month</th>
<th>18-64 Years of Age</th>
<th>65-74 Years of Age</th>
<th>75 Years of Age and Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14 days</td>
<td>79% (6.1M)</td>
<td>63% (428K)</td>
<td>53% (225K)</td>
</tr>
<tr>
<td>15-21 days</td>
<td>10% (770K)</td>
<td>12% (80K)</td>
<td>12% (51K)</td>
</tr>
<tr>
<td>22+ days</td>
<td>11% (847K)</td>
<td>25% (167K)</td>
<td>35% (148K)</td>
</tr>
</tbody>
</table>

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### Days Using OTCs Among Adults Taking DPH/DOX

#### Days per Month

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Two weeks or less</td>
<td>79% (6.1M)</td>
<td>63% (428K)</td>
<td>53% (225K)</td>
</tr>
<tr>
<td>More than two weeks</td>
<td>21% (1.6M)</td>
<td>37% (247K)</td>
<td>47% (199K)</td>
</tr>
</tbody>
</table>
### Daily Alcohol Use Among Adults With Sleeplessness Using DPH/DOX

<table>
<thead>
<tr>
<th>Condition</th>
<th>18-64 Years of Age</th>
<th>65-74 Years of Age</th>
<th>75 Years of Age and Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afib</td>
<td>1% (61K)</td>
<td>3% (21K)</td>
<td>6% (26K)</td>
</tr>
<tr>
<td>Asthma</td>
<td>11% (820K)</td>
<td>7% (50K)</td>
<td>9% (90K)</td>
</tr>
<tr>
<td>BPH (Enlarged Prostate)*</td>
<td>3% (85K)</td>
<td>28% (43K)</td>
<td>36% (28K)</td>
</tr>
<tr>
<td>Constipation</td>
<td>5% (395K)</td>
<td>6% (40K)</td>
<td>11% (47K)</td>
</tr>
<tr>
<td>COPD</td>
<td>1% (101K)</td>
<td>6% (43K)</td>
<td>6% (25K)</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>1% (69K)</td>
<td>5% (32K)</td>
<td>6% (27K)</td>
</tr>
</tbody>
</table>

*Men only

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### Conditions Among Adults With Sleeplessness Who Use DPH/DOX

<table>
<thead>
<tr>
<th>Condition</th>
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</tr>
</tbody>
</table>
### Anticholinergic Use Among Adults With Sleeplessness Using DPH/DOX

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Use (%) (Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-64 Years of Age</td>
<td>23% (1.7M)</td>
</tr>
<tr>
<td>65-74 Years of Age</td>
<td>33% (220K)</td>
</tr>
<tr>
<td>75 Years of Age and Older</td>
<td>44% (187K)</td>
</tr>
</tbody>
</table>

### Key Findings

- NHWS data confirm observations from other studies
- Sleeplessness symptoms are very common in U.S. adult population
- Individuals self-report sleep difficulties in different ways—important for health care professionals to discuss with patients:
  - Assess the length of sleep difficulties and refer patients with chronic symptoms for medical followup
- In older adults, off-label use of OTC sleep aids is observed, particularly:
  - With co-existing health conditions
  - Length of therapy use (i.e., ≥2 weeks)
  - Co-administration with 1+ anticholinergic
  - Co-administration with alcohol
- Opportunity for educating health care professionals on treatment and safety concerns particularly in older adults
Contributions of Pharmacists

• Through pharmacists’ contributions, patients:
  – Will be better informed/educated
  – Will potentially avoid problems associated with these medications (e.g., decreased falls, fewer side effects)
  – Will be less likely to engage in risky medication behaviors
  – Will have better management of their condition
  – Will potentially have an improved quality of life