

**NSU-COM Eighth Annual  
Interprofessional Geriatrics Training Institute**

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**Sleep Disturbance in Dementia: Strategies  
for Patient Improvement and Reduction of  
Caregiver Burden**

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# Speaker Disclosures

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- Dr. Hames has disclosed that she has no relevant financial relationship(s)

# Learning Objectives

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By the end of the session, participants will be able to:

- Identify patterns of sleep disturbance specific to older adults with dementia.
- Understand the recommendations for and limitations of pharmacologic therapy for sleep disturbance in dementia
- Understand the recommendations for non-pharmacologic therapy for sleep disturbance in dementia
- Take with them an idea set for educating caregivers to help improve sleep in persons with dementia

# Scope of the Problem

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- Approximately **50%** of Persons With Dementia (PWD) have sleep and circadian disturbance<sup>1,2</sup>
- Sleep/circadian disturbance in PWD associated with:<sup>1,3,4</sup>
  1. Additional cognitive decline
  2. Functional decline
  3. Increased agitation/confusion/sundowning
  4. Increased risk of falls and injury
  5. Increased caregiver burden
  6. Increased rates of institutionalization
  7. Increased risk of cardiovascular and cerebrovascular disease
  8. Increased risk of depression

<sup>1</sup> Zhou et al. "The Management of Sleep and Circadian Disturbance in Patients with Dementia". *Curr Neurol Neuroscience Rep* (2012). 12:193-204.

<sup>2</sup> Coogan et al. "The Circadian System in Alzheimer's Disease: Disturbances, Mechanism, and Opportunities". *Biol Psychiatry* (2013). 74:333-339

<sup>3</sup> "Sleep Disorders Clinical Practice Guideline". *American Medical Directors Association* (2006).

<sup>4</sup> Bloom et al. "Evidence-Based Recommendations for the Assessment and Management of Sleep Disorders in Older Persons." *J Am Ger Soc* (2009). 57(5):761-789.

# Definitions

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- **Sleep and circadian disorders:**
  - **Primary**
    - Central sleep apnea
    - Obstructive sleep apnea
    - Restless legs syndrome (RLS)
    - Periodic limb movement during sleep (PLMS)
  - **Secondary**
    - Chronic medical conditions and pain
    - Medication use
    - Environmental, psychosocial (depression), behavioral
      - Sleep hygiene

# The Sleep Cycle

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1. Drowsiness
2. Non-rapid eye movement sleep (NREM)
  - Stage N1 – light sleep - *transitional*
  - Stage N2 – 45-55% sleep time
  - Stage N3 – deep sleep (slow wave) - *restorative*
3. Rapid eye movement sleep (REM)
  - Muscular atonia, vivid dreaming, active EEG

Cycles of 90-120 minutes of NREM/REM sleep<sup>4</sup>

More N3 sleep during first half of night

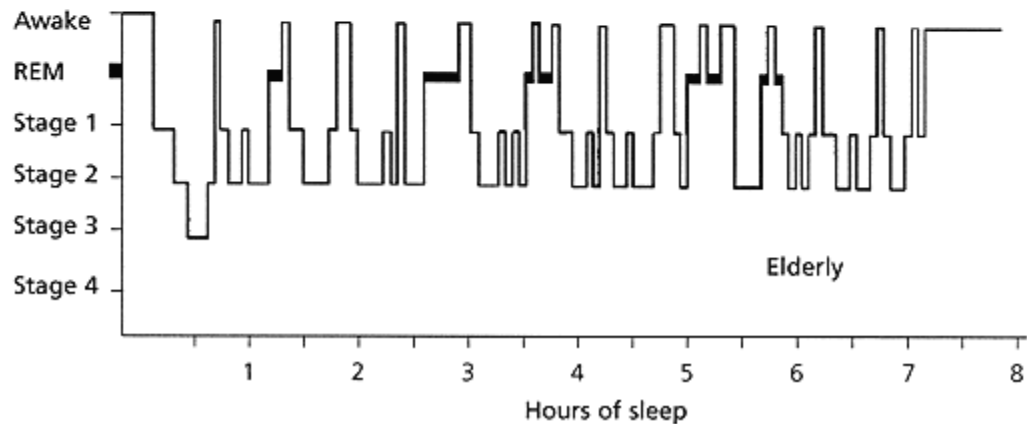
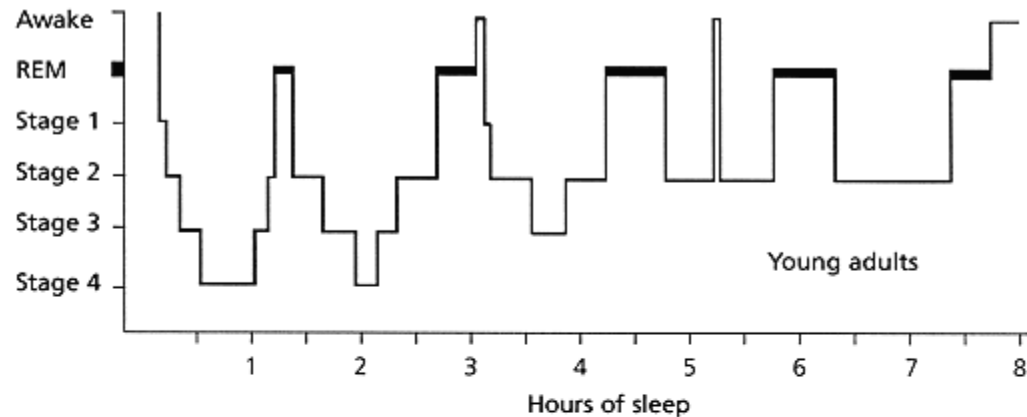
More REM sleep during second half of night

# Common Sleep Changes with Aging<sup>4</sup>

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1. Frequent, repeated, and lengthy awakenings
  - Age-related intrinsic changes in circadian controls
2. Decreased total sleep time
3. Increased sleep latency
4. Reduced sleep efficiency
5. Decreased N3 (slow wave) sleep
6. Decreased REM sleep
7. Increased lighter sleep – N1 and N2
8. Increased daytime sleeping
9. Earlier sleep onset and awakening

# Common Sleep Changes with Aging



Neubauer, *Am Fam Physician*, 1999



# Physiology of Sleep Disturbance in Persons with Dementia

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- Irregular sleep-wake rhythm (ISWR)<sup>1,3,4</sup>
  - Absence of a synchronized circadian sleep/wake cycle
  - Common to **all subtypes** of dementia
  - **Very common** in institutions
  - Minimum of 3 sleep periods of varying length in 24 hour period
  - Fragmented nightly sleep, chronic insomnia, and excessive daytime sleepiness
- When compared to older adults without dementia:
  - More awakenings, lower efficiency, more stage 1 sleep, and less stage N3 sleep

# Physiology of Sleep Disturbance in Persons with Dementia

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- **The pathophysiology of ISWR<sup>1,3,4,5</sup>**
  - **Physiologic theories**
    - Loss of neurons in the suprachiasmatic nucleus (SCN) in the hypothalamus
    - Pre-tangles, tangles, and amyloid plaques in the SCN
    - Less gene expression of light-stimulated Per genes in SCN, less ocular transmission
    - Decreased melatonin secretion (amplitude)

# Physiology of Sleep Disturbance in Persons with Dementia

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- **The pathophysiology of ISWR<sup>1,3,4,5</sup>**
  - **Environmental and Psychosocial factors in post acute & LTC facilities**
    - Lack of light exposure
      - lower levels associated with increased night awakenings<sup>6</sup>
    - Lack of physical activity
    - Lack of social activity
    - Noise and light exposure at night
    - Regimented scheduling

<sup>6</sup>Anconi-Israel et al. "Variation in Circadian Rhythms of Activity, Sleep, and Light Exposure Related to Dementia in Nursing Home Patients." *Sleep* (1997). 20:18-23.

# Physiology of Sleep Disturbance in Persons with Dementia

- **The pathophysiology of ISWR - medications that disrupt sleep<sup>3,7</sup>**

<sup>7</sup> Rose et al. "Sleep Disturbances in Dementia". *J Gerontol Nursing* (2010). 36:9-14.

Drug Class	Examples	Effects on Sleep
Analgesics	opioids	Sedation, ↓ REM, ↓ N3 (deep)
Antidepressants	bupropion, SSRIs	↓ REM, ↓ total sleep time
Antihistamines	diphenhydramine	Daytime sleepiness
Antihypertensives	alpha/beta blockers	Insomnia, nightmares
Dopamine agonists	levodopa / carbidopa	Insomnia, daytime sleepiness
Antipsychotics	quetiapine, olanzapine	sedation
Bronchodilators	theophylline, albuterol	↑ sleep latency, awakenings
CNS stimulants	modafinil, caffeine	↑ sleep latency
Corticosteroids	prednisone, dexameth	↑ sleep latency, awakenings
Decongestants	pseudoephedrine	↑ sleep latency
H-2 Antagonists	Cimetidine, ranitidine	Insomnia, somnolence

# Sleep disorders of Dementia Subtypes<sup>1,4</sup>

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- **Alzheimer's Disease** (mid to late)

- Increased sleep latency
- Decreased N3 (slow wave) sleep
- Decreased REM sleep
- Agitation, sundowning, nocturnal wandering

- **Vascular Dementia**

- Sleep-disordered breathing (impaired central resp drive)
- Daytime somnolence
- Worsening confusion

# Sleep disorders of Dementia Subtypes<sup>1,4</sup>

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- **Parkinson's Disease**

- REM sleep behavior disorder (RBD)
- Frequent awakenings (motor problems)
- Sleep attacks (sudden-onset narcolepsy)

- **Dementia with Lewy Bodies**

- A higher degree of ISWR than other dementias
- RBD – severe hallucinations (damaged REM regulation)
- Most frequent awakenings of all dementia subtypes

# Assessment of Sleep Disorders in Persons with Dementia

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- **American Academy of Sleep Medicine Assessment<sup>8</sup>**
- **Wrist actigraphy**
  - Diagnosis of sleep disorders and response to therapy
  - Sensor worn on non-dominant wrist
  - Worn for  $\geq 3$  days
  - Measures gross motor activity
  - Less reliable if movement disorder present
- **Sleep Log**
  - Used with actigraphy
  - Behavioral observations by nursing staff
- **Polysomnography**
  - **NOT** recommended – only if concomitant primary sleep disorder present (eg apnea)

▪ <sup>8</sup> Sack et al. "Circadian Rhythm Sleep Disorders: Part II, An American Academy of Sleep Medicine Review". *Sleep* (2007). 30:1484-1501

# Management of Sleep Disorders in Older Adults with Dementia

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## Approaches to Management

### Pharmacologic Therapy

- Limited efficacy and controversial recommendations
- Multiple adverse effects
- Short term role in some situations

### Non-pharmacologic Therapy

- Sleep hygiene
- Light therapy
- Sleep/wake scheduling
- Physical and social activity
- Environmental modifications and comfort measures



# Management of Sleep Disorders in Older Adults with Dementia

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## Approaches to Management

### Mixed Modality and Combination therapy

- An individualized combination of pharmacologic and non-pharmacologic treatments
- Overall best results in older adults with dementia and ISWR<sup>1,9,10,11</sup>
- May include short term use of pharmacologic, if appropriate

<sup>9</sup> McCurry et al. "Nighttime Insomnia Treatment and Education for Alzheimer's Disease: A Randomized, Controlled Trial". *J Am Geriatr Soc* (2005). 53:793-802.

<sup>10</sup> Mc Curry et al. "Increased Walking and Bright Light Exposure to Improve Sleep in Community-Dwelling Persons with Alzheimer's Disease: Results of a Randomized, Controlled Trial". *J Am Geriatr Soc* (2011). 59:1393-1402.

<sup>11</sup> Alessi et al. "Randomized, Controlled Trial of a Nonpharmacological Intervention to Improve Abnormal Sleep/Wake Patterns in Nursing Home Residents". *J Am Geriatr Soc* (2005). 53:803-810.

# Pharmacological Strategies

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## Drug therapy for Insomnia in Older Adults

- For patients *without* dementia or with dementia *and* possibly reversible short term insomnia and ISWR<sup>1,3</sup>
- New sleep disturbance beyond a baseline disorder
  - Nightmares
  - Pronounced new latency
- Some causes for short term insomnia
  - Adjustment to new environment
  - Acute illness or uncontrolled pain
  - Bereavement

# Pharmacological Strategies

## Acceptable medications for insomnia - AMDA Guideline<sup>3</sup>

Drug	Class	Onset	Indication	Dose (mg/day)
estazolam	bzd	15-30 min	latency / maintenance	0.5 - 1
eszopiclone	non-bzd	45-60 min	latency / maintenance	1 - 2
lorazepam	bzd	30-60 min	none	1 - 2
melatonin		60-120	N/A	2
ramelteon	melatonin agonist	30-90 min	latency	4- 8
temazepam	bzd	45-60	latency / maintenance	7.5 - 15
trazodone	serotonergic	60-120	* No FDA approval	25 - 50
zaleplon	non-bzd	30	latency	5
zolpidem	non-bzd	15-30	latency	5

# Pharmacological Strategies

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## General Principles of Drug Therapy For Sleep Disorders in Older Adults <sup>3</sup>

- 1 – Use the lowest effective dose
- 2 – Use intermittent dosing (2-4 times weekly)
- 3 – Use medication short-term (3-4 weeks)
- 4 – Discontinue medication gradually
- 5 – Watch for rebound insomnia after D/C
- 6 – Do not automatically continue when there is a transition of care

# Pharmacological Strategies

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- Pharmacologic treatment is still a common practice in treating sleep disorders in older adults *with* dementia
  - Most commonly sedative hypnotics, BZDs, non-BZDs
- Multiple studies report that prescription sleep aids do not improve subjective or objective sleep quality in older adults<sup>12, 13</sup>
- A lack of evidence to guide pharmaceutical treatment of sleep problems in persons with dementia<sup>12</sup>
  - 2014 analysis - no random controlled trials of many drugs widely used for sleep disorders in this population

<sup>12</sup> McCleery et al. "Pharmacotherapies for Sleep Disturbances in Alzheimer's Disease." *The Cochrane Library* (2014). 3:1-52.

<sup>13</sup> McCurry and Ancoli-Israel. "Sleep Dysfunction in Alzheimer's Disease and Other Dementias." *Curr Treat Options Neurol* (2003). 5:261-272

# Pharmacological Strategies

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- **Drug options for persons with dementia & ISWR**
- Multiple studies citing adverse effects of sleep medications<sup>14,15</sup>
  - Worsened sleep disturbance
  - Sedation, confusion, daytime sleepiness
  - Worsening cognition
  - Rebound insomnia
- American Academy of Sleep Medicine does NOT recommend benzodiazepines or melatonin for ISWR

<sup>14</sup> Deschenes and McCurry. "Current Treatments for Sleep Disturbances in Individuals with Dementia." *Curr Psychiatry Rep* (2009). 11:20-26.

<sup>15</sup> Beland et al. "Benzodiazepine Use and Quality of Sleep in the Community-Dwelling Elderly Population." *Aging Ment Health* (2010). 14(843-850).

# Pharmacological Strategies

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- **Recent studies in patients with Alzheimer's**
- **Ramelteon (2014)<sup>12</sup>**
  - Mild to moderate AD
  - Variety of sleep complaints
  - Dose of 8 mg nightly
  - No effect on total sleep time at 1 week or 8 weeks
- **Melatonin (2008, 2003)<sup>12</sup>**
  - 3 studies reviewed
  - Moderate to severe AD
  - Immediate and slow release
  - No improvement in awakenings, sleep efficiency, cognition, or ADLs
- **Trazodone (2014)<sup>12</sup>**
  - Dose of 50 mg nightly for 2 weeks
  - Significant improvement of total sleep time and sleep efficiency
  - No significant adverse effects

# Non-Pharmacological Strategies

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- **Evidence-Based Recommendations – 2009<sup>4</sup>**

- National Sleep Foundation / Mt. Sinai Longevity Center

## In persons with dementia and ISWR:

- 1- exposure to bright light during the day can improve circadian rhythm<sup>15,16</sup> – **level 2A**
- 2 – melatonin is **not** indicated for the treatment of ISWR in older adults with dementia – **level 1B**
- 3 – multimodal approaches that combine daytime bright light exposure, decreased light exposure at night, physical activity, social activity, structured bedtimes and wake times, and noise reduction can decrease awakenings, total wake time, and daytime sleepiness – **level 2A**

<sup>15</sup> Academy of Sleep Medicine. Practice parameters for the clinical evaluation and treatment of circadian rhythm sleep disorders. An American Academy of Sleep Medicine report. *Sleep* (2007). 30:1445–1459.

<sup>16</sup> Sack RL, Auckley D, Auger RR, et al. American Academy of Sleep Medicine. Circadian rhythm sleep disorders: part II, advanced sleep phase disorder, delayed sleep phase disorder, free-running disorder, and irregular sleep-wake rhythm. An American Academy of Sleep Medicine review. *Sleep* (2007).



# Non-Pharmacological Strategies

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- **Nighttime Insomnia Treatment and Education for Alzheimer's Disease: A Randomized, Controlled Trial – 2011 - (NITE-AD)<sup>9</sup>**
  - **Community-dwelling patients with Alzheimer's**
  - **Sleep hygiene recommendations**
  - **1 hour light box**
  - **30 minutes daily walking**
  - **Wrist actigraphy at baseline, posttest, 6 months**
  - **Improved total wake time but no change in sleep quality on Sleep Disorders Inventory**

# Combination Strategies

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## A Stepwise Approach to Sleep Disorders<sup>3,4</sup>

- **Assess for primary sleep disorder**
- **Assess for contributing medical co-morbidities**
- **Assess for medications disturbing sleep**
- **Assess environment and psychosocial factors**
- **Short-term Pharmacological Treatment**
- **Long-term Non-Pharmacological Strategies**

# **Lack of Sleep: Is it truly a clinical “problem”?**

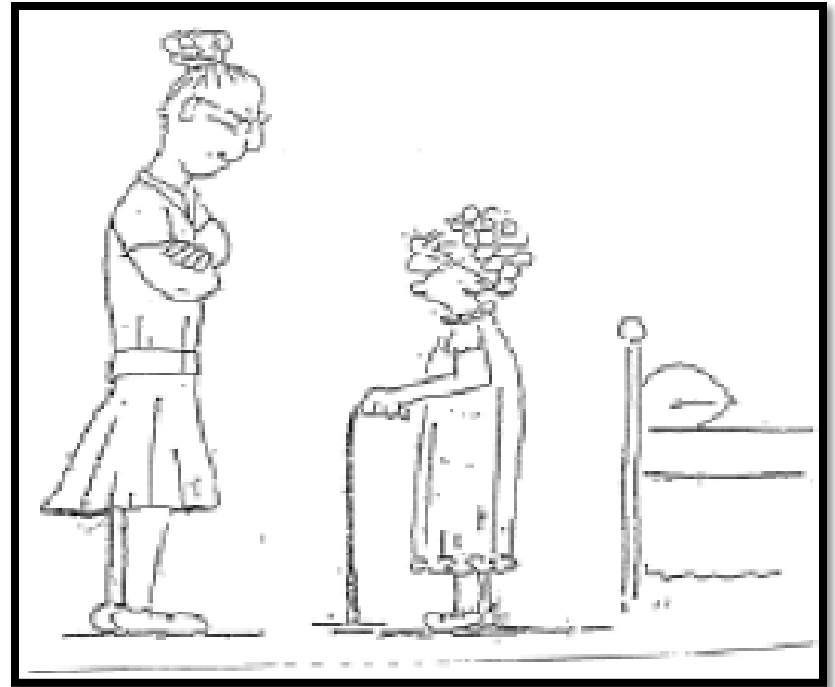
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**Good to first rule out “non-problems”**

- **Staffing—when is it really bedtime?**
  - **If you are “put” to bed at 7 pm and you wake up 8 hours later at 3 am is that a disorder?**
- **Is the sleep/wake cycle disturbance really affecting them negatively? Or is it a problem for the caregivers for them to be up at night?**
- **We need to be clear about what is a true problem and what is an unmet preference or historic habit**
  - **Night owls**
  - **Former night shift workers**

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"Honey, I've been through 2 world wars, the Great Depression, taught 3,297 children, administered 4 elementary schools and outlived every one of the pastors I worked with. I'm 89 years old and ***you're*** telling ***me*** it's bedtime?"



# Taking A Person Centered Approach

- **Focus on the Person**
- **Seeing the person with dementia as an individual human being with a distinct personality**
- **Asking who was/is this person behind the disease?**
- **Meeting the person at their point of need**
- **Support at their highest level of capability & participation**



# A Person Centered Approach

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- **Begin with getting to know the person**
  - **It is important to gather detailed information that the person may no longer recall or be able to tell us**
  - **Interviewing family and former care partners can be very helpful**
  - **Asking the right questions:**
    - **Are we gathering good information beyond the number of hours slept per night?**
      - **Sleep history/habits?**
      - **Have they had a difficult time sleeping always?**
      - **What are their normal routines and rituals at bedtime?**

# A Person Centered Approach

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- **What are the person's sleep preferences?**
  - **Bedding--blankets, sheets, pillows**
  - **Size of bed, mattress**
  - **Preferred temperature of bedroom?**
  - **Typical time to go to sleep?**
  - **TV/Radio/Reading before bed?**
  - **Do they prefer complete darkness? A little light?**
  - **Who's in bed with them? (Or no longer in bed with them?)**
    - **Pets, spouses, children**



# What else could be contributing?

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- **Trouble getting them transitioned to bedtime**
- **Waking and wandering—is there a perceived unrealistic task or “worry” to attend to?**
- **Roommate issues**
- **Waking to urinate**
- **Untreated PAIN!!!**



# Good days lead to good nights

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- **Extensions of earlier tensions of the day can result in leftover stress which interferes with sleep**
- **Late-day Agitation or “Sundowning” is most often caused by:**
  - **Lack of person centered activities throughout day**
  - **Lack of structured routine**
  - **High levels of frustration with tasks caused by a lack of adequate prompting and cueing throughout day**
  - **Lack of a sense of belonging or a maintenance of relationships**

# Non-Pharm Interventions to Consider

- Consider time-honored methods (ask: What worked for them?)
  - Tea
  - Massage/Soothing touch
  - Hot bath
  - Warm milk
  - Being read to
  - Body pillows
  - Pets
  - Hot water bottles
  - Lavender
  - Ambient music/sounds



# Environmental considerations and supports

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- **What is the environment cueing the person to do?**
  - **Does the atmosphere say “go to sleep”**
    - Lower lighting levels for the evening
    - Reduce noise level in hallways and works areas
    - Is there still a lot of activity in the environment—10/11 pm shift change?
    - Can they smell the night shift’s coffee?
  - **What are the staff cueing folks to do?**
    - Are the staff “outpacing” the residents?
    - Bathrobes for the night shift

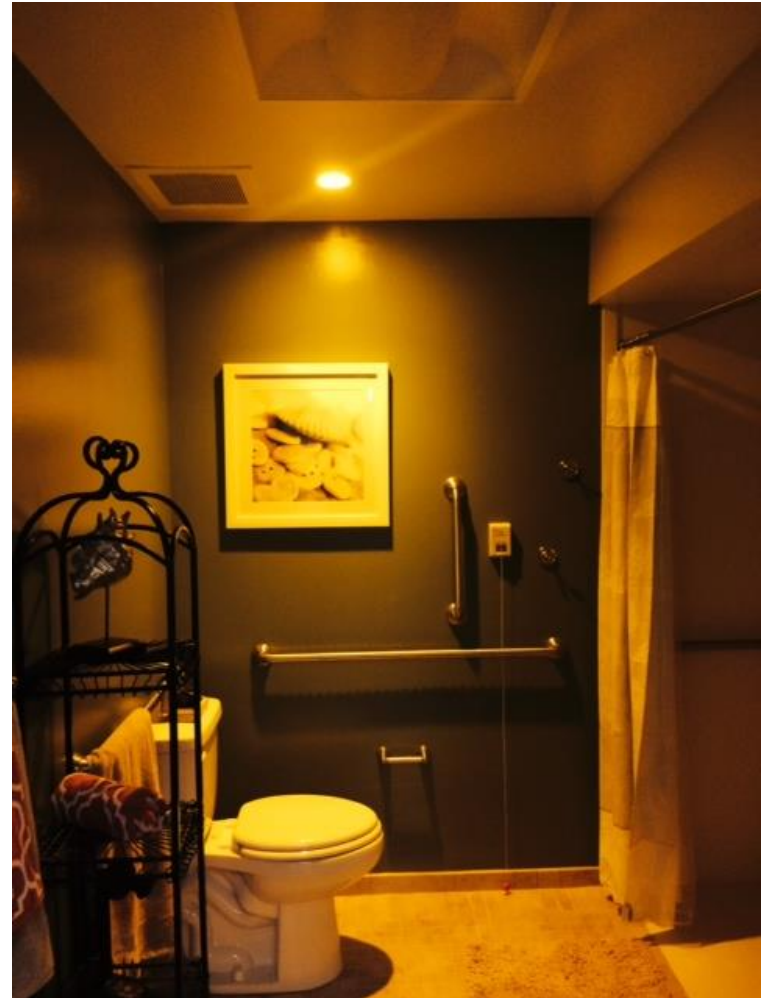


# Environmental considerations and supports

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## Toileting at night

- **Nightlights in bathrooms can help a person to find their way to the toilet at night, but can also be intrusive to sleep**
  - **Amber spot above toilet highlights toilet enough to see, but does not interfere with REM sleep cycling when lit**
  - **Head of bed should have visible line of sight to toilet**



# **Integrating Non-Pharmacological interventions into the plan of care**

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- **Make all care partners aware of honoring preferences, habits, and routines**
- **Put all non-drug methods for relaxation on care plan and even MAR to ensure they get done nightly**
- **Consider drug reductions and eliminations as non-drug methods are successful**

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THANK YOU!

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Questions?