

Sleep Disorders in Neurodegenerative Diseases

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Multi-System Manifestations of Progressive Brain Diseases Conference
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Disclosures

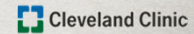
- No Disclosures

Sleep and Healthy Aging

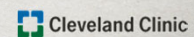
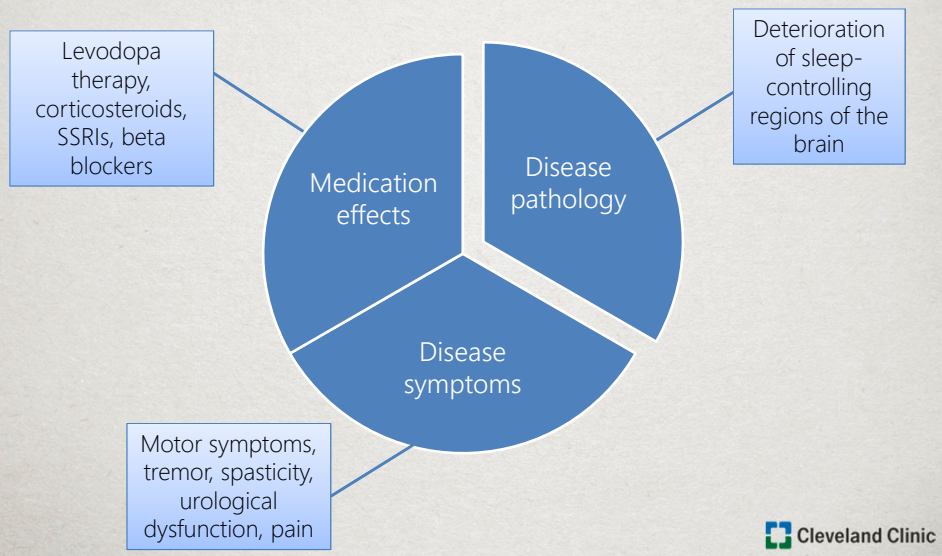
Sleep Parameters	20 to 60 years of age	> 60 years of age
Sleep Duration	↓ 10-12 minutes per decade	minimal to no change
Sleep Latency	↑ minimally	minimal to no change
Sleep Maintenance	↑ 10 minutes per decade	minimal to no change
Sleep Efficiency	↓ significantly	↓ declines very slowly
Napping Duration	Evidence unclear	Evidence unclear

Circadian Markers	Across the Lifespan
Sleep Timing	Phase advance by 60 minutes
Melatonin Secretion	↓ with age

Li, Vitiello, & Gooneratne, 2018



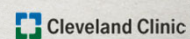
Impact of Neurodegenerative Diseases on Sleep



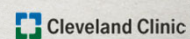
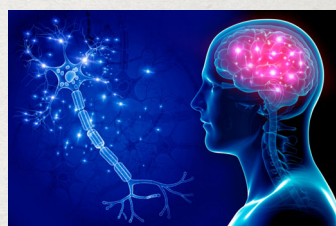
Impact of Poor Sleep in NDD Populations

- Reduced quality of life
- Psychiatric symptoms
- Reduced independence & functional status
- Excessive daytime sleepiness/fatigue
- Increased cognitive impairment
- Accelerated disease progression
- Increased caregiver burden

Breen et al., 2014; Gaugler et al., 2001; Shin et al., 2014;



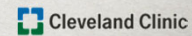
Common Sleep Disorders in Neurodegenerative Diseases



Sleep Disorders: Parkinson's disease (PD)

- Common sleep disruptions:
 - **Insomnia** (60-70% prevalence in PD)
 - Motor symptoms (bradykinesia, rigidity, and tremor)
 - Psychiatric symptoms
 - **Hypersomnia**
 - Excessive daytime sleepiness (50% prevalence in PD)
 - Relationship to levodopa therapy

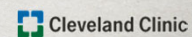
Chung et al., 2013; Gherstad et al., 2006; Yang et al., 2018; Zhang et al., 2017



Sleep Disorders: Parkinson's disease (PD)

- Common sleep disruptions:
 - **Movement-related sleep disorders**
 - Restless legs syndrome (20% prevalence in PD)
 - Periodic limb movements
 - **Parasomnias**
 - REM sleep behavior disorder (60% prevalence in PD)
 - Potential for injury

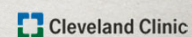
Chung et al., 2013; Gherstad et al., 2006; Ondo et al., 2002; Yang et al., 2018; Zhang et al., 2017



Sleep Disorders: Alzheimer's disease and related dementias (ADRD)

- Common sleep disruptions:
 - **Insomnia** (25-44% prevalence in AD)
 - Fragmented sleep
 - Daytime fatigue
 - **Breathing-related sleep disorders** (40-70% prevalence in AD)
 - Fragmented sleep
 - Daytime sleepiness, fatigue, & napping
- Circadian disruptions:
 - **Irregular sleep-wake patterns** (moderate-severe ADRD)
 - Prolonged periods of nocturnal wakefulness
 - Intermittent periods of daytime sleep periods

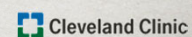
Brzecka et al., 2018; Malhotra, 2019



Sleep Disorders in Multiple Sclerosis

- Common sleep disruptions:
 - **Insomnia** (50% prevalence in MS)
 - Spasticity
 - Neurogenic bladder
 - Psychiatric symptoms
 - **Breathing-Related Sleep Disorders**
 - Obstructive Sleep Apnea
 - **Restless Legs Syndrome** (10-15% prevalence in MS)
 - Daytime sleepiness

Barner et al., 2008; Braley & Chervin, 2015



Sleep Disorders in Neurodegenerative Diseases

Underreported

Underdiagnosed

Undertreated



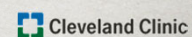
Sleep Screening & Assessment: Medical Provider Perspective



Sleep Screening: Starting (& *Maintaining*) the Conversation

- Inquire about sleep quality and quantity routinely at every clinic visit
- Ideally, investigation of sleep complaints should be incorporated into a review of systems
 - Determine nature of sleep complaints & etiology factors
 - How might *nocturnal* neurological symptoms interfere with sleep?
 - Tremors, rigidity, dyskinesia, urinary frequency, spasticity, pain, etc.

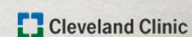
Braley et al., 2012



Sleep Screening Questions: Outpatient Settings

Selected domains	Suggested questions
Sleep timing	<i>What time do you typically fall asleep and get up each day?</i>
	<i>How many hours are you sleeping each night?</i>
	<i>Do you have trouble falling asleep or getting up?</i>
Sleep awakenings	<i>What gets in the way of falling asleep?</i>
	<i>Do you have trouble staying asleep at night?</i>
	<i>How many times do you wake up?</i>
Frequency	<i>What usually wakes you up?</i>
	<i>How often do these disturbances occur?</i>
Napping	<i>Do you nap daily? Duration?</i>
Daytime impact	<i>How do sleep problems affect you the next day (mood, cognition, energy, performance)?</i>

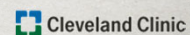
Bloom et al., 2009



Additional Sources of Data

- Caregiver/Bed Partner Observations
 - Sleep-wake patterns
 - Nocturnal observations that patients may not be aware of:
 - Snoring, gasping for air, choking
 - Vocalizations, nocturnal movements
- Actigraphy
 - Activity monitor for rest-activity periods
 - Useful in presence of cognitive deficits

Martin & Hakim, 2011

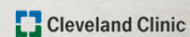


Brief Patient Screening Questionnaires

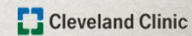
Sleep Complaints	Selected Measures	Authors
Insomnia	Insomnia Severity Index	Bastien et al., 2001
	Pittsburgh Sleep Quality Index	Buysse et al., 1989
Obstructive Sleep Apnea	STOP-BANG Questionnaire	Chung et al., 2008
Excessive Daytime Sleepiness	Epworth Sleepiness Scale	Johns, 1991
Fatigue	Fatigue Severity Scale	Krupp et al., 1988

**Limited in presence of cognitive deficits*

**Not intended to replace detailed clinical sleep interview*

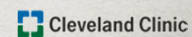


Sleep Management Interventions: Medical Provider Perspective

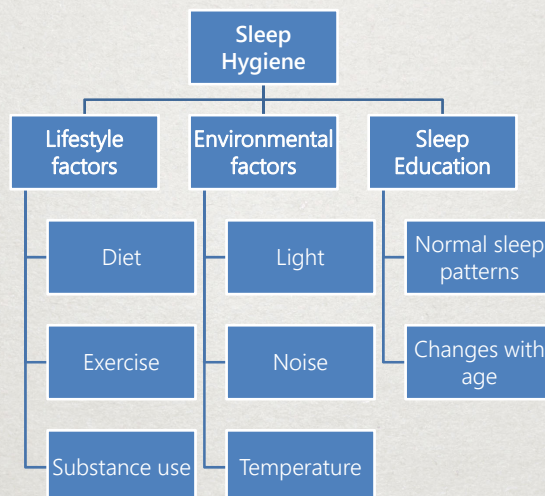


Management of Medical Conditions

- Are current medical conditions and/or symptoms independent of sleep *optimally* managed?
 - Are medication adjustments needed?
 - Consideration of referral to specialty medicine clinics for further evaluation and/or treatment
 - Ex: Pain, urological conditions
 - Non-pharmacological interventions
 - Occupational/physical rehabilitation



What about Sleep Hygiene for Chronic Insomnia?



Edinger et al., 2021

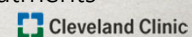
Sleep Hygiene = Not an effective stand-alone treatment for insomnia disorder

- American Academy of Sleep Medicine (2021)
 - Sleep hygiene not recommended as single-component treatment for chronic insomnia disorder
 - Sleep hygiene recommendations are **necessary but insufficient** to treat insomnia disorder
 - Exclusive focus = delays initiation of more effective behavioral sleep interventions

To Rx or Not: Sleep-Promoting Medications

- Evidence suggests modest improvements in sleep latency and duration
 - Limited evidence available for PD/MS populations
 - Benefits dissipate following discontinuation of medications
- Risk-benefit ratio for NDD populations
 - Dependency
 - Cognitive impairment
 - Falls/fractures
 - Daytime sedation
- Ultimately, collaborative decision-making between provider-patient
 - Preferences, values, and access to non-pharm treatments

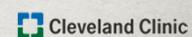
Sateia et al., 2017



To Rx or Not: Sleep-Promoting Medications

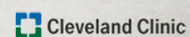
- Moderate-Severe Dementia (AD)
 - Lack of empirical evidence regarding prescribing guidelines
 - Especially other dementia subtypes
 - Behavioral strategies recommended 1st
 - Risk-benefit ratio
- Ultimately, collaborative decision-making between provider-patient
 - Preferences, values, and access to non-pharm treatments

McCleery & Sharpley, 2020



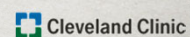
Referral to Sleep Medicine

- Require specialized evaluation and/or treatment
 - **Breathing-related sleep disorders**
 - Polysomnography
 - Increased adherence to PAP therapy
 - **Movement-related sleep disorders**
 - Polysomnography (RBD, PLMD)
 - Pharmacological management
 - **Hypersomnolence disorders**
 - Polysomnography
 - Multiple sleep latency test
 - Pharmacological management
 - **Circadian-rhythm sleep disorders**
 - Specialized behavioral treatment



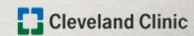
Referral to Sleep Medicine

- Chronic Insomnia Disorder
 - Specialized behavioral treatment
- Minimal to no benefit from sleep medications
- Persistent sleep difficulties despite NDD treatment optimization
- NDD + additional medical comorbidities

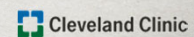
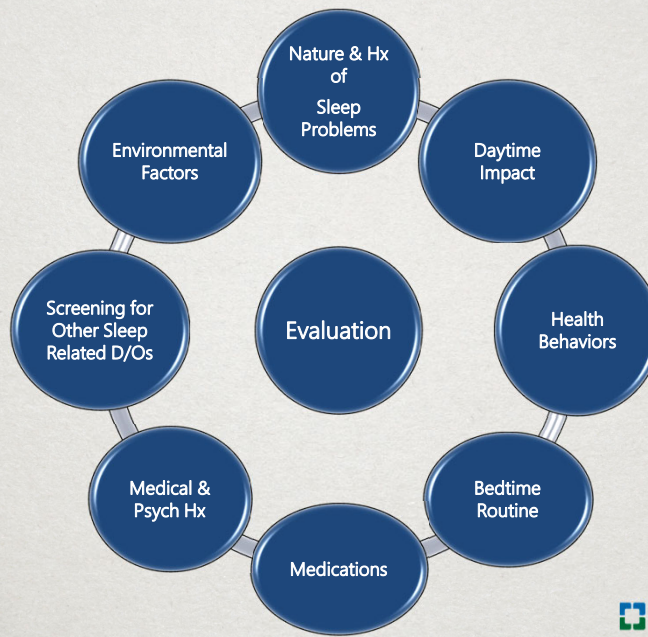


Referral to Behavioral Sleep Medicine Provider

- Focused on the evaluation and treatment of sleep disorders by addressing behavioral, psychological, and physiological factors that interfere with sleep
- Clinical expertise to tailor behavioral treatments to NDDs



Behavioral Sleep Medicine Evaluation



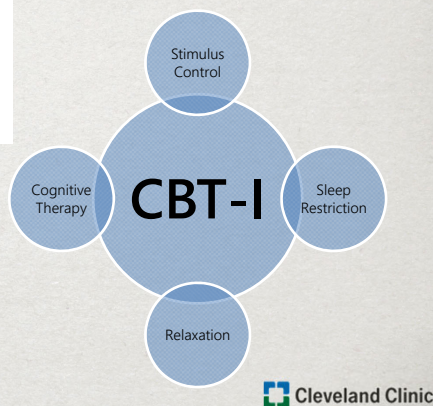
1st Line Treatment for Insomnia: Cognitive Behavioral Therapy for Insomnia

Cognitive behavioral therapy for insomnia (CBT-I)

Recommendation 1: We recommend that clinicians use multicomponent cognitive behavioral therapy for insomnia for the treatment of chronic insomnia disorder in adults. (STRONG)

Remarks: This recommendation is based primarily on studies in which CBT-I was delivered by a trained professional to patients with and without comorbid conditions.

American Academy of Sleep Medicine, 2021

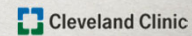


Behavioral Treatments Applicable to NDD Populations

- Individualized approach to CBT-I
 - Sleep education:
 - Understanding impact of their specific NDD on sleep
 - Setting realistic expectations for treatment outcomes
 - Adjusting behavioral treatments for:
 - Physical & motor limitations
 - Mild cognitive impairment
 - Integrating (often) complicated NDD medication regimen (i.e., levodopa therapy) and dosing schedule into treatment
 - Strategic use of napping
 - Inclusion of care partner into treatment to reinforce session content

Behavioral Treatments Applicable to NDD Populations

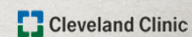
- CBT for hypersomnia
- CBT for circadian rhythm disorders
 - Lightbox therapy
- Behavioral strategies to support tapering off sedative medications



Behavioral Treatments Applicable to Dementia

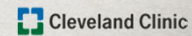
- Bright light therapy
 - Target: 60-120 minutes of exposure during morning hours
- Consistency in daytime & bedtime routine
 - Stimulating activities
 - Physical exercise (30 minutes/daily)
 - Limit napping
- Collaboration and education with family caregiver is essential
- Management of medical comorbidities
- Medication review

Hanford & Figueiro, 2013; Ooms & Ju, 2016



How Do I Find a Behavioral Sleep Medicine Provider?

- International Directory for the Society of Behavioral Sleep Medicine
 - <https://www.behavioralsleep.org/index.php/unit-ed-states-sbsm-members>
- International Directory of CBT-I Providers
 - <https://cbti.directory/>



Conclusions

- Sleep disturbances in neurodegenerative diseases are **very common**.
- Clinical **assessment** and continual **monitoring** of sleep is part of comprehensive neurological care.
- **Behavioral sleep interventions** should be considered as part of a multidisciplinary approach to manage.

