Sleep and Mental Health

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White River Junction
Objectives

- Identify common sleep disorders in primary care
- Understand basic management for sleep disorders
- Describe the bidirectional relationship between sleep disorders and mental health
Why Do We Sleep?

- All lifeforms sleep
- We eventually die without sleep
- Restore bodily functions, repair damaged tissue, conserve energy
- Removal of brain waste
- Temperature regulation
Sleep Disturbances

-negatively impacts physical health, mental health, and quality of life

-immune function

-neural plasticity

-affective regulation

-neuroendocrine regulation
Sleep Disturbances and Mental Health

- risk factor for the development, persistence, and relapse of psychiatric disorders

- 3-4 fold increase in psychiatric disorders in those with sleep disruptions (Hossain et al., 2002)

- circadian and sleep disruptions are found in up to 90% of those with depression (Cunningham et al., 2018)

- increase risk for suicidal ideation, suicide attempt, and suicide (Pigeon et al., 2012)
Obstructive Sleep Apnea (OSA)

**Symptoms:** (patient and bed partner)
- Snoring
- Witnessed apneas
- Gasping for breath
- Morning headache
- Dry mouth, sore throat
- Restless sleep
- Changes in mood
- Impaired concentration/memory
- Unrefreshing sleep
- Excessive daytime sleepiness
- Middle of the night awakenings:
  - insomnia
  - nocturia
Untreated OSA

- increased risk for sleepy driving, CAD, hypertension, arrhythmias, sudden death, stroke, endocrine dysfunction, increased all cause mortality (Westerman, 2017)

- increase risk for depression, exacerbate mood symptoms, and contribute to refractory treatment for depression (Murphy et al, 2015)

- may exacerbate and perpetuate PTSD symptoms (Jaoude et al, 2015)
STOP-BANG: >3 sleep referral

STOP

<table>
<thead>
<tr>
<th>S</th>
<th>So you snore loudly (louder enough to be heard through closed doors or louder than talking)?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Do you often feel tired, fatigued or sleepy during the daytime?</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>O</td>
<td>Has anyone observed you stop breathing or choking or gasping during your sleep?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>P</td>
<td>Do you have or are you being treated for high blood pressure?</td>
<td>Yes</td>
<td>No</td>
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</tbody>
</table>

Bang

<table>
<thead>
<tr>
<th>B</th>
<th>BMI more than 35?</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>a</td>
<td>Age – over 50 years old?</td>
<td>Yes</td>
<td>No</td>
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<td>n</td>
<td>Neck circumference – is it greater than 17” if you are a male or 16” if you are a female?</td>
<td>Yes</td>
<td>No</td>
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<td>g</td>
<td>Gender – are you a male?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Epworth Sleepiness Scale

Chung et al, 2016
Home Sleep Apnea Testing (HSAT)
In-lab Sleep Testing:
Treatment for OSA:

Positive Airway Pressure (PAP)

- Continuous positive airway pressure (CPAP) and AutoCPAP

- Bilevel Positive Airway Pressure (BPAP)
Masks: We’ve come a long way...
CPAP Treatment Outcomes

- improves sleepiness, quality of life, neurocognitive deficits from OSA, concentration (Avidan, 2018)

- improvement in psychiatric comorbidities
  
  * anxiety, depression (Avidan, 2018)
  
  * PTSD symptoms (El-Solh et al; 2017)
Oral Appliance therapy

Mandibular Advancement Device (MAD):
-alternative to PAP therapy
-or those intolerant to PAP therapy

During sleep there is restricted airway space
Mandibular repositioning device (MRD) increases airway space
Hypoglossal Nerve Stimulator (Inspire)

- moderate to severe OSA
- recent in-lab sleep study
- failed/intolerant to CPAP
- BMI <32 or 35
Behavioral Modifications

Positional Therapy
- avoiding supine sleep
- zzoma pillow

- healthy weight loss and exercise

- avoiding sedating substances and medications
Central sleep apnea (CSA)

- Sleep disturbances/daytime impairment
- Methadone, suboxone, morphine, oxycodone, hydrocodone, fentanyl patches
- Withdrawal of the opiate may resolve the CSA

ICSD 3, Westerman, 2017
Restless Legs Syndrome (RLS)

“When you try to relax in the evening or sleep at night, do you ever have unpleasant, restless feelings in your legs that can be relieved by walking or movement?”

-difficulties with falling and staying asleep, daytime sleepiness

https://www.rls-uk.org/diagnosis
RLS and Mental Health

- Increased odds ratio for depression, anxiety, panic, PTSD

- Treatment of RLS may help with depression symptoms

- ¼ of patients with RLS have ADHD symptoms and 12-35% of patients with ADHD meet RLS criteria
RLS Treatment

- Abnormalities in brain dopamine and iron

- Ferritin levels ≤ 75 µg/l
- Antidepressants/antipsychotics
- Antihistamines
- Substances
- OSA
- Alpha 2 delta ligands
- Dopamine agonists

Silber et al., 2021
Periodic Limb Movement Disorder (PLMD)

-80%-90% of RLS patients also have PLMs

-antidepressants are associated with PLMD

**Treat:**
- medication culprits
- check ferritin
- comorbid sleep disorders such as OSA

(Westerman, 2017; ICSD 3)
Circadian Rhythm Disorders

circadian rhythm disorders are often associated with increased incidence of psychiatric disorders (Abbott et al., 2015)

-Delayed Sleep-Wake Phase Disorder (DSWPD)

-Advanced Sleep-Wake Phase Disorder (ASWPD)
Photic Zeitgeber

- Physical activity
- Meals
- Sleep-wake cycle
- Social time

Nonphotic Zeitgeber

Suprachiasmatic nuclei “master clock”

Peripheral oscillators

Cellular oscillators

Clock genes

https://www.researchgate.net/figure/Photic-and-nonphotic-zeitgebers-in-humans-and-their-role-on-the-circadian-clock-which_fig1_350179017
Peripheral Clocks

Kryger et al., 2017
**INSTRUCTIONS:**
1. Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation.
2. Put the letter “C” in the box when you have coffee, cola or tea. Put “M” when you take any medicine. Put “A” when you drink alcohol. Put “E” when you exercise.
3. Put a line (__) to show when you go to bed. Shade in the box that shows when you think you fell asleep.
4. Shade in all the boxes that show when you are asleep at night or when you take a nap during the day.
5. Leave boxes unshaded to show when you wake up at night and when you are awake during the day.

**SAMPLE ENTRY BELOW:** On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn’t get back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7:00 in the morning.

<table>
<thead>
<tr>
<th>Today’s Date</th>
<th>Day of the week</th>
<th>Type of Day</th>
<th>Noon</th>
<th>1PM</th>
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<th>4</th>
<th>5</th>
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**TWO WEEK SLEEP DIARY**
## Actigraphy

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>1/18/2018</td>
<td><img src="image1" alt="Chart" /></td>
</tr>
<tr>
<td>Friday</td>
<td>1/19/2018</td>
<td><img src="image2" alt="Chart" /></td>
</tr>
<tr>
<td>Saturday</td>
<td>1/20/2018</td>
<td><img src="image3" alt="Chart" /></td>
</tr>
<tr>
<td>Sunday</td>
<td>1/21/2018</td>
<td><img src="image4" alt="Chart" /></td>
</tr>
<tr>
<td>Monday</td>
<td>1/22/2018</td>
<td><img src="image5" alt="Chart" /></td>
</tr>
<tr>
<td>Tuesday</td>
<td>1/23/2018</td>
<td><img src="image6" alt="Chart" /></td>
</tr>
<tr>
<td>Wednesday</td>
<td>1/24/2018</td>
<td><img src="image7" alt="Chart" /></td>
</tr>
</tbody>
</table>
Delayed Sleep-Wake Phase Disorder

- delay in sleep and wake times

- sleep onset insomnia

- days off/weekend
Delayed sleep-wake phase disorder: Low dose melatonin (0.5-3mg) 5 hrs prior to habitual sleep time; combined with bright light therapy after awakening  (Abbott et al, 2015)
Advanced sleep-wake disorder

- early bedtime and awake time
- seen more in older populations
- important to distinguish this from early morning awakenings due to depression
- evening bright light

(Abbott et al, 2015)
<table>
<thead>
<tr>
<th>Circadian Rhythm Sleep-Wake Disorder</th>
<th>Diagnosis</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed sleep phase type</td>
<td>Recommended: Sleep logs and/or actigraphy for at least 7 d</td>
<td>Advance circadian phase: Low dose (0.5–3 mg) of melatonin, 5 h before habitual bedtime; bright light (at least 5000 lux) for 30 min to 2 h on awakening.</td>
</tr>
<tr>
<td></td>
<td>Optional: Biomarkers such as salivary DLMO. Morningness/eveningness questionnaires</td>
<td></td>
</tr>
<tr>
<td>Advanced sleep phase type</td>
<td>Recommended: Sleep logs and/or actigraphy for at least 7 d</td>
<td>Delay circadian phase: Bright light (at least 5000 lux) for 2 h in the evening (eg, 7–9 pm)</td>
</tr>
<tr>
<td></td>
<td>Optional: Biomarkers such as salivary DLMO. Morningness/eveningness questionnaires</td>
<td></td>
</tr>
<tr>
<td>Irregular sleep-wake type</td>
<td>History and sleep diary (can be completed by caregiver) and/or actigraphy</td>
<td>Consolidate nocturnal sleep: Mixed modality therapy: daytime bright light, melatonin at bedtime (in children); structured activities</td>
</tr>
<tr>
<td>Non-24-h sleep-wake type</td>
<td>Recommended: Sleep logs and/or actigraphy for at least 14 d</td>
<td>Entrainment: Blind: Melatonin (0.5 mg) or tasimelteon 1 h before habitual bedtime Sighted: Bright light on awakening, regular sleep wake schedule. ± melatonin</td>
</tr>
<tr>
<td></td>
<td>Optional: Sequential measurement of phase markers (eg, salivary DLMO or urine melatonin)</td>
<td></td>
</tr>
<tr>
<td>Shift work type (night)</td>
<td>Clinical history: Sleep logs and/or actigraphy may also be helpful</td>
<td>Align circadian rhythm to work schedule: Sleep hygiene; bright light intermittent exposure at work; avoid bright light in the early morning; low-dose melatonin sleep time. Excessive sleepiness: Modafinil/armodafinil, scheduled naps, caffeine, bright light Insomnia symptoms: Melatonin, hypnotics</td>
</tr>
</tbody>
</table>
Phototherapy: light boxes

Sleep
Mood
Energy
Menopause and Sleep

-increased prevalence for sleep disorders

-Vasomotor symptoms (VMS) and insomnia:
  * 69% reported VMS associated with awakenings
  * Hormone therapy/antidepressants

-Mood disorders: depression

-OSA: prevalence triples; independent of Body Mass Index

-Circadian changes

-RLS/PLMs: women are 37% more likely than men to report symptoms

Kryger, 2017
Insomnia

- Difficulty initiating, maintaining sleep, or awakening too early,
- Significant distress or impairment
- Insomnia Severity Index (ISI)
Insomnia and mental health

- bidirectional relationship between insomnia and mental health disorders

- 40% of individuals with insomnia have a coexisting mental health disorder (Ohayon et al. 1998).

- Insomnia is reported in 80% of patients with major depression, which increases to 90% with a concurrent anxiety disorder (Ohayon 2002).

- Insomnia increases the risk of developing depression by two-fold (Baglioni et al. 2011).
Cognitive Behavioral Therapy for Insomnia (CBT-I)

-first-line treatment for chronic insomnia (Schutte-Rodin et al, 2008)
-effective treatment with long-term benefits

Stimulus control
Sleep restriction
Sleep hygiene
Relaxation therapy
Cognitive therapy
## Insomnia: FDA approved medications

<table>
<thead>
<tr>
<th>Medication</th>
<th>Starting dose</th>
<th>Usual dose</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-Benzodiazepine Receptor Agonists</strong></td>
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<tr>
<td>Zolpidem</td>
<td>5mg females 5-10mg males</td>
<td>5-10mg</td>
<td>sleep-onset insomnia</td>
</tr>
<tr>
<td>Zolpidem extended-release</td>
<td>6.25mg</td>
<td>6.25-12.5mg</td>
<td>sleep-onset and maintenance insomnia</td>
</tr>
<tr>
<td>Zolpidem Tartrate Sublingual (Intermezzo)</td>
<td>1.75mg females 3.5mg males</td>
<td>same as starting</td>
<td>Middle-of-the-night waking</td>
</tr>
<tr>
<td>Eszopiclone</td>
<td>1mg</td>
<td>1-3mg</td>
<td>sleep-onset and maintenance insomnia</td>
</tr>
<tr>
<td>Zaleplon</td>
<td>5mg</td>
<td>10-20mg</td>
<td>sleep-onset insomnia</td>
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<tr>
<td><strong>Melatonin Receptor Agonists</strong></td>
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<tr>
<td>Ramelteon</td>
<td>8mg</td>
<td>8mg</td>
<td>sleep-onset insomnia</td>
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<tr>
<td><strong>Selective Histamine Receptor Antagonist</strong></td>
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<tr>
<td>Doxepin</td>
<td>3mg</td>
<td>3-6mg</td>
<td>sleep maintenance insomnia</td>
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<tr>
<td><strong>Dual Orexin Receptor Antagonist</strong></td>
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<tr>
<td>Suvorexant</td>
<td>5mg</td>
<td>10-20mg</td>
<td>sleep-onset and maintenance insomnia</td>
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<tr>
<td><strong>Benzodiazepine Receptor Agonists</strong></td>
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<tr>
<td>Temazepam</td>
<td>7.5mg</td>
<td>7.5-30mg</td>
<td>sleep-onset and maintenance insomnia</td>
</tr>
</tbody>
</table>
**Insomnia: Not FDA approved medications**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Starting dose</th>
<th>Usual dose</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other medications</strong>*</td>
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</tr>
<tr>
<td>Amitriptyline</td>
<td>10mg</td>
<td>10-100mg</td>
<td>comorbid depression or chronic pain</td>
</tr>
<tr>
<td>Trazodone</td>
<td>25mg</td>
<td>25-150mg</td>
<td>comorbid depression or substance use</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>7.5mg</td>
<td>7.5-30mg</td>
<td>comorbid depression</td>
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<tr>
<td>Quetiapine</td>
<td>25mg</td>
<td>25-200mg</td>
<td>comorbid psychosis or mania</td>
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<tr>
<td>Gabapentin</td>
<td>100mg</td>
<td>100-900mg</td>
<td>comorbid pain or alcohol use</td>
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<tr>
<td>Melatonin</td>
<td>0.3mg</td>
<td>0.3-10mg</td>
<td>circadian rhythm disorders or dementia</td>
</tr>
</tbody>
</table>

Cucchiara, B. L., & Price, 2021
Thank you!