Wisconsin Public Psychiatry Network Teleconference (WPPNT)

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Non-Medication Approaches for Delayed or Advanced Sleep-Wake Rhythm Issues

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Outline

• Clinical scenarios
• Definitions
  • The circadian rhythm
  • Delays and advances in circadian rhythm and developmental trends
  • Circadian rhythm sleep-wake disorder, delayed and advanced sleep phase type
• Prevalence and co-morbidities
• Assessment
• Light exposure (and movement and food)
• Melatonin
• Stimulus control (and RISE or STAY UP)
• Putting treatment into practice
Clinical Scenarios
Sleeping and Waking Too Late

Mike has struggled with challenges falling asleep for years. He has also struggled with depression. With medication and therapy, he has found ways to work with his depression. However, he has had little success in budging what he thinks of as his insomnia, finding sleep medications tend to do little to nothing for him. His difficulty falling asleep (and great challenges waking up—even with multiple alarm clocks!) has led to many lost jobs, missed appointments, and frustration. He has tried to keep a regular sleep schedule that would allow for more desirable work, keeping appointments, etc. However, he found his sleep difficulties just persisted, and he was too concerned to not compensate for his sleep as increased sleep loss tends to trigger more extreme depressive symptoms for him. Plus, he just could not get out of bed some mornings. Hopelessness about his sleep has increased with time along with increased worries of how his sleep issue will continue to impact his depression and life long-term.
Sleeping and Waking Too Early

Although Mary had always been somewhat of an early bird, she started waking up earlier than she wanted and had a hard time going back to sleep. She found herself so tired as the day moved on, but did her best to continue with her daytime work schedule. When she came home around 6pm, she could hardly make it through the door before finding herself asleep in a chair in her living room for most of the evening, waking on occasion to try to eat dinner or catch a part of a television program. Around 9:30/10pm, her partner would wake her to go to bed, and she would fall asleep there easily. However, she would wake early again and start the process all over. She grew concerned about how her chores and unpaid bills were piling up, and she started to take care of these responsibilities once awake during the night. This led to computer screen time and stimulating activities at night. She also started to feel more low and down during the day as she was so tired that she really found herself not enjoying anything and also cancelling evening plans regularly due to how tired she felt.
Definitions
• The circadian rhythm:
  • is a biological process central to sleep and wakefulness timing
  • involves changes in our own body’s melatonin (increases during sleep and decreases during wakefulness), core body temperature (decreases during sleep and increases during wakefulness), and a host of other physiological processes
  • is directly impacted by our behavior, including exposure to:
    • light or darkness
    • movement or non-movement
    • eating or fasting
    • all of the above relate to signals for wakefulness or sleep, respectively
The Two-Part Process of Sleep

- Homeostatic regulation (the sleep drive)
- Circadian regulation (the body’s clock)
- Keeping in mind hyperarousal/conditioning

Delays and Advances

• Individuals vary on the spectrum of circadian rhythm preferences from:
  • advanced phase (“morningness” or “early birds”) to
  • delayed phase (“eveningness” or “night owls”)

• A delay in circadian rhythm is a normal part of puberty, so a delay in sleep phase is more common in adolescence and young adulthood

• An advance in circadian rhythm is more likely in older adulthood

DSM-5 Circadian Rhythm Sleep-Wake Disorders, Delayed or Advanced Sleep Phase Type

- “A persistent or recurrent pattern of sleep disruption that is primarily due to an alteration of the circadian system or to a misalignment between the endogenous circadian rhythm and the sleep-wake schedule required by an individual’s physical environment or social or professional schedule.

- The sleep disruption leads to excessive sleepiness or insomnia, or both.

- The sleep disturbance causes clinically significant distress or impairment in social, occupational, and other important areas of functioning.
  - Delayed sleep phase type: A pattern of delayed sleep onset and awakening times, with an inability to fall asleep and awaken at a desired or conventionally acceptable earlier time.
  - Advanced sleep phase type: A pattern of advanced sleep onset and awakening times, with an inability to remain awake or asleep until the desired or conventionally acceptable later sleep or wake times.”
Prevalence and Co-Morbidities
Prevalence and Co-Morbidities

• In a sample of individuals who were 20-59 years old, the prevalence of Delayed Sleep Phase Disorder was 1.5 to 8.9% and Advanced Sleep Phase Disorder was 0.3 to 7.1%.

• In a sample of individuals who were 16-26 years, the prevalence of Delayed Sleep Phase Disorder was 4% and delayed sleep phase (eveningness) was 4.6%.

• Eveningness and Delayed Sleep Phase Disorder are both associated with psychiatric disorders
  • In a sample of individuals with either eveningness or Delayed Sleep Phase Disorder, 50% of this sample met criteria for a current psychiatric disorder (general population rate of about 26%)

Reid et al. (2012) *Sleep Med*, 13(9), 1171-1177.
Assessment
What to look for when considering a delayed rhythm?

- Night owl history; evening preference
- Significant sleep initiation difficulties and significant delayed wake-up times (sleep inertia) when following a more conventional schedule (e.g., 11pm-7am)
- Less disturbed sleep when allowed to follow a more natural rhythm (e.g., 3am-11am)
- Helpful to have sleep logs and to keep track of days with a conventional versus natural schedule
Average total sleep time = 10 hours
Average time to fall asleep = 3:00 am
Average time awake = 1:00pm
What to look for when considering an advanced rhythm?

• Early bird history; morning preference
• Significant issues staying awake in the evening and often dozing and significant early morning wake-ups when following a more conventional schedule (e.g., 11pm-7am)
• Less disturbed sleep when allowed to follow a more natural rhythm (e.g., 7pm-3am)
• Helpful to have sleep logs and to keep track of days with a conventional versus natural schedule
Average total sleep time = 4.5 hours + ~3 hours dozing
Average time to asleep = 10:00 pm + (6:30-9:30 pm dozing)
Average time awake = 2:30am
Light Exposure
(and movement and food)
Light Exposure (and movement and food)

• Light pushes on the circadian rhythm
  • For those with delayed sleep timing, light when first awake for the day will help move the rhythm earlier
  • For those with advanced sleep timing, it is opposite. Light at the end of the day will help move the rhythm later

• Light exposure at the appropriate time above usually starts at 30 minutes and can be up to a few hours

• The phase-shifting effect of light is at least 2-5 times greater than for external melatonin

• Consider pairing light with other helpful cues for wakefulness like movement and food

Light Exposure (and movement and food)

• What about dim or no light conditions, including no use of electronic devices?
  • For those with delayed sleep timing, dim or no light in the later evening and during the night
  • For those with advanced sleep timing, dim or no light during the night and in the early morning

• Consider decreasing movement and not eating when dim or no light conditions are recommended

Light Boxes

• Natural light is effective for light exposure, but can be more challenging due to season and whether there is easy or safe access to the outdoors

• Light boxes (10,000 lux) are another option

• Potential side effects include eyestrain, headache, irritability, and insomnia

• Light boxes are not recommended for individuals:
  • taking medications that cause photosensitivity
  • who have macular degeneration or retinopathy
  • who have bipolar disorder (can increase risk for mania or hypomania)

Melatonin
Melatonin

• Melatonin **pulls** on the circadian rhythm
  • For those with delayed sleep timing, melatonin at night before bed will help move the rhythm earlier
  • For those with advanced sleep timing, it is opposite. Melatonin in the early morning will help move the rhythm later

• For phase-shifting effects, low doses are recommended (e.g., 0.5 mg)

• Potential side effects include headache, dizziness, drowsiness, nausea, and nightmares

• Melatonin is not recommended for individuals:
  • taking anticoagulants
  • who are pregnant, planning to be pregnant, or nursing

Stimulus Control
(and RISE UP or STAY UP)
Stimulus Control:  
Reassociating the Bedroom with Sleeping &  
Setting the Body’s Clock

• Select a standard wake-up time
• Select a standard bedtime (but waiting until sleepy to go to bed)
• Avoid sleep-interfering activities in bed—NO SCREENS!
• Get out of bed after 15-30 minutes when unable to sleep and engage in non-stimulating and non-productive activities—again, NO SCREENS!
  • For delayed sleep, this will be used more so at the beginning of the night with issues falling asleep
  • For advanced sleep, this will be used more so in the early morning with early morning awakenings
• Avoid napping

Bootzin (1972)
RISE UP (to help with delayed sleep)

• **Refrain from snoozing**
  - Put alarm clocks around the room
  - Use an appliance timer to turn on a bedroom lamp
  - Ask for help from family or friends

• **Increase activity within the first hour of wakefulness**
  - Put feet on the floor
  - Walk around

• **Shower or wash face and hands**

• **Extra sunlight**
  - Open curtains or blinds
  - Go outside

• **Upbeat music**

• **Phone a friend**
  - Make plans each day that start earlier

STAY UP (to help with advanced sleep)

• Think about activities to do at night that do not lead to dozing
• Think about pacing time for relaxation in the evening by getting up briefly at regular intervals and doing something small like washing a few dishes or opening a piece of mail
• Consider a less comfortable chair or standing up to watch television
• Make plans for the evening outside the home
  • meet up with a friend, run errands, go for a walk
• Consider being outdoors and getting light
Putting Treatment Into Practice
Mike: Sleeping and Waking Too Late

Average total sleep time = 10 hours
Average time to fall asleep = 3:00 am
Average time awake = 1:00pm
Putting Treatment Into Practice

• We discuss Mike’s goals. Given the impact his sleep is having on his daily functioning, he is open to trying something new to improve his sleep.

• Given his goals match treatment, his average total sleep time, clock time falling asleep, and clock time waking up for the day from the sleep log are computed.
  • Mike’s sleep log demonstrates an average wake-up time of 1pm. His average time falling asleep is 3am. His average total sleep time is about 10 hours.
Putting Treatment Into Practice

• We identify a starting sleep schedule. Given Mike’s sleep log, we could start with a schedule around 3am-1pm. This is a good fit to both his rhythm and his average total sleep time.
  • With this 3am-1pm sleep schedule, he would start with light exposure (and movement and food) at 1pm for 30 minutes or more.

• As quickly as every other day, his wake-up time (and bedtime) could be advanced by 30 minutes. For example, the next step would be 2:30am-12:30pm. He continues with this advancing until landing at his desired sleep schedule.
  • His current target is 11pm-9am, which we will continue to check in about to see if this is the best fit for his daily life and sleep need.
Putting Treatment Into Practice

• We consider strategies to cope with difficulty falling asleep and difficulty getting out of bed (stimulus control and RISE UP)
  • For stimulus control:
    • Mike likes to read and also listen to music, so he selects these two activities as a point of focus when he is struggling to fall asleep; he is aware to use actual books for this (versus an e-reader) and plans to make a trip to the library; he is also aware that he needs to keep phone use (where he has music playlists) to a minimum so that he does not get light from the screen during the time he wishes to sleep
  • For RISE UP:
    • Mike has tried putting alarm clocks across the room before without success. However, he feels pretty good about his initial wake-up time and thinks this will be less challenging. He knows he can call upon a friend if he struggles to wake up. He plans to get up each morning and shower and then turn on upbeat music and drink coffee outside.
Putting Treatment Into Practice

• Once to his desired sleep schedule (11pm-9am), he would:
  • continue with a regular sleep schedule with the exceptions of getting ill, travel, and very special events;
  • use stimulus control strategies for getting out of bed as he needs to;
  • keep a RISE UP routine of some kind, keeping light exposure (and movement and food) as high priorities in the morning;
  • consider increasing his strategies based upon season (usually fall and winter are the hardest for delayed sleep phase);
  • keep in mind that staying up later even “just for the weekend” will likely make weekdays more challenging on a regular basis, so trying to keep changes to a minimum so that each week is not a recovery from the weekend; and
  • have the skills to move his sleep schedule earlier or later as needed with any schedule changes in his daily life.
|       | 10 pm | 10:30 pm | 11 pm | 11:30 pm | 12 am | 12:30 am | 1 am | 1:30 am | 2 am | 2:30 am | 3 am | 3:30 am | 4 am | 4:30 am | 5 am | 5:30 am | 6 am | 6:30 am | 7 am | 7:30 am | 8 am | 8:30 am | 9 am | 9:30 am | 10 am | 10:30 am | 11 am | 11:30 am | 12 pm | 12:30 pm | 1 am | 1:30 pm | 2 pm |
|-------|-------|----------|-------|----------|-------|----------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|-------|----------|
| Baseline |       |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 1-2 |       |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 3-4 |       |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 5-6 |       |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 7-8 |       |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 9-10|       |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 11-12|      |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 13-14|      |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |
| Day 15-16|      |          |       |          |       |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |      |          |

Remember stimulus control strategies when struggling with difficulties falling asleep!

Remember RISE UP strategies to keep wake-up time on track!
Mary: Sleeping and Waking Too Early

Average total sleep time = 4.5 hours + ~3 hours dozing
Average time to asleep = 10:00 pm + (6:30-9:30 pm dozing)
Average time awake = 2:30am
Putting Treatment Into Practice

• We discuss Mary’s goals. She really wants to get back to a more regular schedule, so she would like to give this a try.

• Given her goals match treatment, the average total sleep time, clock time falling asleep, and clock time waking up for the day from the sleep log are computed.
  • Mary’s sleep log demonstrates an average wake-up time of 2:30am. Her average time falling asleep in bed is 10pm. She is dozing from about 6:30-9:30pm nightly. Her total sleep time in her bed is 4.5 hours. If we add in her dozing, she is sleeping about 7.5 hours on average daily.
Putting Treatment Into Practice

- We identify a starting sleep schedule. Given Mary’s sleep log, we could start with a schedule around 7pm-2:30am. This is a good fit to both her rhythm and her average total sleep time.
  - With this 7pm-2:30am sleep schedule, she would start with light exposure (and movement and food) at 6pm for 30 minutes or more.

- As quickly as every other day, her bedtime time (and wake-up time) could be delayed by 30 minutes. For example, the next step would be 7:30am-3am. She continues with this advancing until landing at her desired sleep schedule.
  - Her current target is 10pm-5:30am, which we will continue to check in about to see if this is the best fit for her daily life and sleep need.
Putting Treatment Into Practice

• We consider strategies to cope with difficulty staying awake at night and early morning awakenings (STAY UP and stimulus control)
  • For STAY UP:
    • Mary really liked the idea of pacing time for relaxation and doing brief activities. She realized this would be different than her typical approach, seeing each task through from start to finish. We discussed breaking up the dishes, paying of bills, and picking up the house while also having some time to sit down and watch her favorite television show. She found watching for 5 minutes and then taking a break to do a quick activity worked best. She also liked the idea of going for a walk at night as she had really cut back on exercise.
  • For stimulus control:
    • It was hard to think about not taking care of chores as early mornings had been her more productive time in recent months. However, she was open to trying to protect the time she was up early in the morning for sleep. Since she often fell asleep watching television, she chose television as one of her non-stimulating activities. We discussed trying to catch herself if she was about to doze and returning to bed. As a back up, she identified a couple of books she could read. She understood to stay off the computer when awake at night and not start her day early with a shower, coffee, or breakfast.
Putting Treatment Into Practice

• Once to her desired sleep schedule (10pm-5:30am), she would:
  • continue with a regular sleep schedule with the exception of getting ill, travel, and very special events;
  • keep a STAY UP routine of some kind with the main aim of avoiding dozing;
  • use stimulus control strategies for early morning awakenings and not act on the urge to be productive or efficient if she woke up early;
  • have the skills to move her sleep schedule earlier or later as needed with any schedule changes in her daily life.
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Remember STAY UP strategies when struggling with dozing!
Remember stimulus control strategies when struggling with early morning awakenings!
Summary

• Delays and advances in sleep are part of a typical spectrum of circadian rhythm preferences
  • Those with a large impact on daily functioning often meet criteria for a circadian rhythm sleep-wake disorder
  • Delays in sleep are part of normative adolescent development
  • Advances in sleep are more typical for older adults
  • Delays in sleep are associated with psychiatric disorders

• There are easy assessment tools to detect if delays or advances in sleep are present through both clinical interaction and sleep logs
Summary

• There are key behavioral interventions, including light exposure and stimulus control (and RISE UP or STAY UP strategies)
  • These interventions take time and effort to practice, but can be effective in changing circadian patterns

• There are some individuals who need to take caution when working with these interventions, particularly those with bipolar disorder or medical issues sensitive to light
  • however, adaptations can be made to effectively work with circadian rhythm issues for these individuals too