Delayed Sleep Wake Phase Disorder (DSWPD)



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Summary: Delayed sleep-wake phase disorder (DSWPD) is a condition where people have trouble falling asleep on time, which then causes problems when they can't wake up on time for obligations at home, school or work. It happens due to a biological difference where the person's internal clock is delayed by 2-hrs or more. DSWPD is not due to a person being lazy or unmotivated. The good news is that many things can be done to adjust the person's internal clock to fit better with the demands of society.

D's Story, Part 1

D. is a young adult living at home with his parents. When he was younger, he could go to bed by 9 PM and wake up for 6 AM. But ever since becoming a teenager, when 9 PM comes around, he is simply not tired and seems to get a "second wind. Various strategies have been tried, including putting away all electronics by 8 PM and trying calming activities before bedtime. He finally falls asleep at 1 AM. Unfortunately, then he struggles to get up at 8 AM for school, even with multiple alarms and parents' efforts to wake up. He goes to school exhausted, his marks have dropped significantly this school year.
What's going on? Is he just being difficult, or is there something else?

Notice Any of the Following?

Do you or your loved one notice the following:

- Troubles falling asleep at appropriate bedtimes.
- Daytime sleepiness. Because they have to wake up early (for them), they tend to be sleepy and tired.
- Unable to wake up at the regular time.
- Better sleep when they are allowed to sleep in. Typically, they will sleep in on weekends or holidays, and during those times, sleep is normal.
- Stress, anxiety and depression. Sleep deprivation, along with stress from parents, school (and work) can contribute to stress, anxiety and depression. Others may mistakenly label them lazy, unmotivated, and oppositional. Sometimes, these persons can turn to drugs such as alcohol or cannabis to fall asleep earlier, which can open the door to other problems.
- Night owl. They often report being more awake and alert later at night, past when others have already gone to sleep.

If so, then it may be something called delayed sleep-wake phase disorder...

What is Delayed Sleep-Wake Phase Disorder (DSWPD)?

DSWPD is a sleep disorder characterized by a discrepancy between one's circadian clock's internal setting and the sleep-wake schedule required by home, school or work obligations. The person has trouble getting to sleep on time, ends up going to bed too late, and then ends up exhausted when they have to wake up the following day. It causes significant distress and impairs one's social, educational or occupational functioning (American Psychiatric Association, 2013).
When the person tries to sleep like everyone else (e.g. go to bed at 11 PM, wake up at 7 AM), their sleep quality is very poor. However, they have significant improvements in their sleep when they go to bed later and wake up later.

Normal Sleep Physiology

Sleep timing is controlled by the master circadian clock, located in a part of the brain called the suprachiasmatic nucleus. This clock determines what time we should go to sleep and what time we wake up. Our clock requires constant "resetting" by external time cues (aka "zeitgebers"), and the most important ones that set our clock include exposure to sunlight during the morning and daytime, as well as exposure to darkness in the evenings. Other time cues that influence this biological clock include physical activity, mealtimes, and work /social schedules.

What Causes Delayed Sleep-Wake Phase?

In normal adolescence, there is a shift towards a delayed sleep phase in puberty, where adolescents will need to go to bed later and wake up later. This sleep phase then advances with each decade. In people with DSWPD, this shift is more extreme. If these persons try to work/live in a typical societal schedule (e.g. try to sleep from 11 PM to 7 AM), they can experience significant problems due to the mismatch between their social / work schedule and their internal clock (circadian phase).
There seems to be a link between those with DSWPD and conditions such as ADHD and bipolar disorder.

Could I Have Delayed Sleep-Wake Phase?

Two ways to really confirm if you might have delayed sleep-wake phase are:
1) Consider doing the Morning-Eveningness Questionnaire
https://chronotype-self-test.info/index.php?sid=61524&newtest=Y
The results of this questionnaire will help inform whether you are a morning type ("lark"), intermediate type, or evening type ("night owl").
Did you identify as an evening type? If so, then you may be at higher risk of DSWPD.
2) Do you have the opportunity to take a vacation for two weeks with no obligations where you can sleep and wake up whenever you feel most comfortable?
If so, then track this with sleep logs, or a wearable sleep-tracking device.
Do you find your most "comfortable sleep" starts after 2 AM, and wake-up time is routinely 10 AM or later? This means you may have an increased risk of DSPWD.

I Think I Have Delayed Sleep-Wake Phase… What Now?

Wondering about delayed sleep-wake phase?

- First, start by gathering information about your sleep.
    - Keep a sleep diary or sleep log. Ways to do this include: a) downloading a paper log from the internet; b) using a sleep tracking app; c) using a wearable sleep type device that tracks your sleep data. Typically, when people with DSWPD can go to bed later and sleep in, their sleep quantity and quality will improve.
- If so, then see your healthcare provider.
    - Show your health care provider the information.

- The health care provider may also ask questions to see if you might have other sleep issues, such as
  - Snoring, possibly suggesting unrecognized sleep apnea.
  - Restlessness in the legs, possibly suggesting restless legs syndrome.

Self-Help Strategies for Delayed Sleep-Wake Phase

Morning

- Ensure regular, consistent wake-up times.
- Consider a daylight simulator as the morning alarm clock. Consider using 10 000 lux lightbox for 30-60 min at desired wake time (e.g. 7 AM).
- Consider bright light therapy in the morning right after awakening (30-60 min each morning) to advance the circadian rhythm.
- Otherwise, ensure exposure to sunlight in the morning and daytime.
  - Light exposure can be gradual.
  - Do you sleep in until 12 PM?
    - Start with light exposure at 12 PM.
    - After that, gradually advance by 30-min. every 2-days until the desired goal wake up time is reached.
  - Light exposure is safe for most people. Common side effects can include eye strain and headaches. Rare adverse effects include troubles with light sensitivity, migraines, mania in people at risk for bipolar disorder.
- Are there any eye problems?
  - If so, then see your optometrist or ophthalmologist.

Afternoon / dinnertime

- Take a low dose of melatonin 0.5 mg at 6-8 hrs before bedtime to shift the circadian rhythm earlier by 90-120 min.
  - Are you up until 12 AM? Give at 4-6 PM.
  - Are you up until 2 AM? Give at 6-8 PM.
  - Adjust as necessary. The timing is important and several weeks of consistent use of melatonin at the same time are required to determine whether this approach can be helpful.

Evening

- Ensure good sleep hygiene.
- Have regular bedtimes.
- Avoid backlit screens past 8-9 PM, as the blue light will keep you awake and suppress melatonin production in the evenings. Melatonin at night is necessary to facilitate sleep onset and maintenance.
- Ensure a dim light environment at night time. Eliminate any bright lights (especially blue light) before bedtime.
- Alternatively, consider wearing blue light blocking glasses to block blue spectrum light.

Bedtime

- Engage in quiet, relaxing activities such as reading, drawing, writing to “wind down” before bedtime.
- Avoid electronic activities as they can be activating due to blue light (even with ‘a low blue light mode’) and mentally stimulating (e.g. social media, news, etc.)
- Do you absolutely need an electronic device?
  - If so, use it for audio like music, mindfulness meditation tracks or apps, etc.
- Are there still troubles despite trying the above?
  - If so, then melatonin 3-5 mg bedtime at 30-60-min. before bedtime, followed by a dim environment.

Melatonin

Dosage

- Melatonin can be given at low doses (0.5-1 mg) 6-8 hrs before bedtime to help advance the body's clock, making it easier to fall asleep.
- Melatonin can be given at higher doses (3-10 mg) to help you fall asleep, usually given 30-60-min. before bedtime.
    - Avoid using melatonin over 10 mg daily, as this can "spill over" and make it hard to wake up the following morning.

Side Effects with Melatonin

- Commonly reported effects may include
    - Headaches
    - Hypotension
    - Nightmares
    - Daytime sedation.
- Are they mild? If so, consider continuing melatonin to hope that side effects will improve.
- If not, then stop the melatonin and explore other options.

Does the person belong to any of these groups below?

- Children
- Adolescents with delayed puberty
- Women of reproductive age
- Patients with depression or epilepsy
- Patients on warfarin.
- If so, then let your health care provider know so that they can provide close monitoring.

Societal and Policy Interventions

Since sleep phase delay is so common in adolescents and has a physical, biological basis, there are many school districts that have decided to accommodate by delaying school start times. Benefits include improvement in academic performance, student well-being and less family stress.
As adults and employees, people with sleep phase delay presumably do better in occupations that accommodate a later start time, e.g. restaurant workers (in restaurants that serve lunch/dinner), self-employed individuals, evening shifts (not day shifts), etc.

Will It Get Better?

With hard work and effort, DSWPD does get better. The rewards are great, allowing people to wake up refreshed and do better at home, school and work.

D's Story, Part 2

D. sees his doctor, who diagnoses delayed sleep-wake phase disorder (DSWPD).
The doctor recommends the following:

- Low dose melatonin (0.5 mg), taken 5-hrs before bedtime to advance his circadian system
- Bright light exposure in the morning, starting at his wake-up time and progressively advancing by 30-min. every few days
- Put electronics away by 9 PM. Unfortunately, D. has trouble putting away his electronics. His doctor

recommends that D. wear orange-coloured glasses (i.e. low blue light, or blue light blocking glasses) and replace his normal full-spectrum night table light with a red light (i.e. low blue light) in his bedroom.

After a few weeks of hard work, D. is able to fall asleep more easily and wakes up more quickly for school and work.

When and Where to Refer

Are there still struggles with sleep phase issues despite trying the above? If so, see your primary care provider.

About this Document

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Conflicts of Interest: No competing interests declared.

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