



## Circadian Rhythm Sleep-Wake Disorders (CRSD)

### Overview

Each of us has a brain-based body clock called a circadian rhythm. This clock triggers our bodies to feel and do different things at different times of the day based on the near 24-hour light-dark cycle. For most people, daytime triggers feelings of being alert and energetic, and nighttime triggers a desire to sleep.

People with CRSD have sleep-wake timing that does not match the time of day and typical school, social, and work schedules. If you have ever had jet lag, you may be familiar with this: you've taken a long flight and your body clock has not adjusted to the new time zone leading to difficulty falling and staying asleep as well as sleepiness. The clock says that it is time to sleep (night), but your mind and body are wide awake or, the clock says it is time to be awake (day) but your mind and body want to sleep. People with CRSD experience this on a regular basis and this leads to impairment in daily life.

### There are 7 main types of CRSD:

1. **Shift Work Disorder** affects people who work nights or frequently change their work shift. Similar to jet lag, their body clocks are unable to adjust their sleep-wake schedule to their work schedule resulting in them getting less sleep than they need. People with this condition may complain of difficulty falling and or staying asleep and excessive sleepiness.
2. **Advanced Sleep-Wake Phase Disorder** causes a tendency to fall asleep much earlier than what is typical. People with this condition may be called "early birds" or "larks" and wake up earlier than what is typical. They may complain of early morning awakening and sleepiness in the early evening.
3. **Delayed Sleep-Wake Phase Disorder** causes a tendency to say up late with difficulty waking up when expected. People with this condition may be called "night owls" and feel most productive late at night. They may be chronically late for work or school and/or function poorly during the day.
4. **Irregular Sleep-Wake Rhythm Disorder** causes irregular sleep-wake patterns throughout a 24-hour period such that a person might sleep across several irregularly scheduled bouts. These bouts may seem like naps. People with this condition may complain of sleepiness and have difficulty participating in scheduled activities that require sustained wakefulness like work, school, and social life.
5. **Non-24 Hour Sleep-Wake Rhythm Disorder** causes periods of difficulty falling and staying asleep and or excessive daytime sleepiness alternating with periods without these symptoms. People with this condition may complain of sleepiness and have difficulty participating in scheduled activities that require regularly scheduled wakefulness like work, school, and social life.
6. **Jet Lag Disorder** occurs after transmeridian jet travel across at least two time zones. It causes difficulty falling and or staying asleep with excessive daytime sleepiness and a reduction in total sleep time. People with this condition also experience general malaise, gastrointestinal disturbance, and general difficulty functioning in work, school, and or social life within one or two days after travel. Typically, this condition is worse with eastward travel. The condition generally resolves itself, taking one or two days after travel, per time zone, for the person to adjust.
7. **Circadian Rhythm Sleep Disorder not Otherwise Specified** is a disorder reserved for people who may have certain aspects of the difficulties noted above, but do not clearly fit any of these classifications. For example, some medical problems and diseases can cause circadian rhythm dysregulation, including some mental illnesses, Parkinson Disease, Alzheimer Disease, and Huntington Disease.



## Circadian Rhythm Sleep-Wake Disorders (CRSD)

In order for unusual sleep patterns to be considered a sleep disorder, an individual must have a pattern of sleep-wake timing and associated sleep and daytime complaints which occurs for at least three months. Jet Lag is the only exception to this criterion.

### Causes

Multiple factors coming together can cause a CRSD. Some people may have a genetic predisposition to developing a CRSD. Some medical and mental health problems are associated with increased risk for development of a CRSD. Importantly, the body clock needs appropriately-timed light exposure to work properly. Therefore, people who don't get good exposure to light during the day and/or have too much exposure to bright light during the evening may be at risk for developing a CRSD. Not surprisingly, blindness is associated with development of CRSD as is a tendency to have irregular routines in daily living. Additionally, travelling across time zones and work schedules that do not allow regular sleep and wake patterns corresponding with day and night can trigger CRSD.

### Signs and Symptoms

- Difficulty falling and or staying asleep and difficulty staying awake on a typical schedule.
- Impairment in school, work, social, or other life as a result of sleep problems.

### Tests and Diagnosis

Because people with these disorders are unable to sleep at the times when they are expected to, they frequently have signs and symptoms of insomnia, but in order for treatment of the insomnia to be successful, the underlying problem with the body clock needs to be detected and addressed as well. One key difference between insomnia and insomnia with CRSD is that if the person is allowed to sleep on their preferred sleep schedule, they might not have any trouble sleeping.

### Treatment

Once diagnosed, your healthcare provider may refer you to a specialist for treatment, including:

- **Light Therapy:** This therapy synchronizes the body clock by exposing the eyes to safe levels of intense, bright light for brief durations at strategic times of day.
- **Chronotherapy:** This therapy involves shifting (i.e. either advancing or delaying) the timing of sleep a little bit each day (1 to 2 hours) until the desired schedule is achieved. Since this process can be challenging and requires a flexible work schedule, a significant commitment on behalf of both the patient and the provider is needed for success.
- **Lifestyle Change:** Adjusting exposure to daylight, making changes in the timing of daily routines, and strategically scheduling naps.
- **Melatonin:** Per physician guidance, taking melatonin at precise times and doses may alleviate the symptoms of some CRSDs.