

# Understanding the Complex Relationship Between Sleep and Narcolepsy

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## DESCRIPTION

Narcolepsy, a chronic neurological disorder affecting the brain's ability to regulate sleep-wake cycles, presents a complex interplay between sleep and various neurological mechanisms. This disorder is characterized by excessive daytime sleepiness, sudden muscle weakness (cataplexy), hallucinations, and disrupted nighttime sleep. Understanding how narcolepsy alters sleep patterns and the underlying mechanisms involved is important for managing the condition and improving the quality of life for those affected.

### The sleep-wake cycle and narcolepsy

The sleep-wake cycle is governed by a delicate balance between different brain regions and neurotransmitters. In healthy individuals, this cycle is typically regulated by the circadian rhythm and sleep homeostasis, ensuring that sleep and wakefulness are maintained in an orderly manner. Narcolepsy disrupts this balance, primarily due to deficiencies in certain neurotransmitters and abnormalities in brain structures responsible for sleep regulation [1].

One of the hallmarks of narcolepsy is Excessive Daytime Sleepiness (EDS), which is not just a desire to sleep but an overwhelming urge that can lead to uncontrollable naps throughout the day. This excessive sleepiness arises from a disruption in the normal regulation of wakefulness, with individuals often experiencing an intense need to sleep despite having had sufficient night time rest. The primary driver of EDS in narcolepsy is thought to be the loss of hypocretin (also known as orexin), a neurotransmitter that plays a crucial role in maintaining wakefulness and regulating Rapid Eye Movement (REM) sleep [2].

### REM sleep and narcolepsy

Rapid Eye Movement (REM) sleep is a stage of sleep characterized by vivid dreams, muscle atonia (loss of muscle tone), and rapid eye movements. In individuals with narcolepsy, REM sleep can occur abnormally early in the sleep cycle. Typically, REM sleep begins about 90 minutes into a normal

sleep cycle, but for those with narcolepsy, it may begin within minutes of falling asleep. This early onset of REM sleep contributes to the fragmented nature of sleep experienced by narcoleptics.

The intrusion of REM sleep into wakefulness can lead to several symptoms associated with narcolepsy, including cataplexy and hypnagogic hallucinations. Cataplexy is a sudden loss of muscle tone triggered by strong emotions such as laughter or surprise, resulting in temporary weakness or paralysis. This symptom occurs because the boundaries between REM sleep and wakefulness become blurred. Hypnagogic hallucinations are vivid and often frightening experiences that occur while falling asleep, further disrupting the sleep-wake boundary and affecting overall sleep quality [3].

### Night time sleep disruption

Contrary to common belief, individuals with narcolepsy do not necessarily experience longer sleep durations but rather have a fragmented and less restorative sleep pattern. Night time sleep in narcolepsy is often marked by frequent awakenings and difficulty maintaining continuous sleep. This disruption is linked to the abnormal regulation of REM sleep and can exacerbate daytime sleepiness. The presence of multiple awakenings throughout the night can prevent individuals from reaching the deeper stages of restorative sleep, such as Slow-Wave Sleep (SWS). This lack of restorative sleep can compound daytime symptoms and affect overall health and well-being. The fragmented sleep architecture in narcolepsy means that although individuals may spend a considerable amount of time in bed, they do not achieve the same quality of sleep as those without the disorder [4].

### Management and treatment

Managing narcolepsy requires a comprehensive approach that addresses both daytime symptoms and night time sleep disturbances. Treatment strategies often include medications and behavioral interventions designed to stabilize sleep patterns and improve overall function. Medications used to manage narcolepsy include stimulants such as modafinil or armodafinil,

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which help reduce excessive daytime sleepiness, and antidepressants that can help control cataplexy and other REM sleep-related symptoms. Sodium oxybate, a medication that promotes deep sleep and reduces night time awakenings, is also commonly prescribed to improve both night time and daytime symptoms. Behavioral strategies can be equally important in managing narcolepsy. Maintaining a regular sleep schedule, implementing scheduled naps during the day, and practicing good sleep hygiene can help mitigate the impact of narcolepsy on daily life. Cognitive-Behavioral Therapy (CBT) may also be beneficial in addressing the psychological aspects of living with narcolepsy, such as coping with the chronic nature of the disorder and its impact on personal and professional life [5].

## CONCLUSION

The relationship between sleep and narcolepsy is multifaceted and reflects the disorder's impact on both nighttime sleep and daytime wakefulness. Narcolepsy disrupts the normal regulation of the sleep-wake cycle, leading to excessive daytime sleepiness, early REM sleep onset, and fragmented nighttime sleep.

Understanding these disruptions is crucial for developing effective treatment strategies and improving the quality of life for individuals with narcolepsy. Continued research into the underlying mechanisms of narcolepsy will further enhance our ability to manage this complex disorder and provide better support for those affected.

## REFERENCES

1. Barateau L, Pizza F, Plazzi G, Dauvilliers Y. Narcolepsy. *J Sleep Res.* 2022;31(4):e13631.
2. Latorre D, Sallusto F, Bassetti CL, Kallweit U. Narcolepsy: A model interaction between immune system, nervous system, and sleep-wake regulation. *Semin Immunopathol.* 2022;44(5):611-623.
3. Bassetti CL, Adamantidis A, Burdakov D, Han F, Gay S, Kallweit U, et al. Narcolepsy-clinical spectrum, aetiopathophysiology, diagnosis and treatment. *Nat Rev Neurol.* 2019;15(9):519-539.
4. Dauvilliers Y, Billiard M, Montplaisir J. Clinical aspects and pathophysiology of narcolepsy. *Clinical Neurophysiology.* 2003;114(11):2000-2017.
5. Dauvilliers Y, Barateau L. Narcolepsy and other central hypersomnias. *Continuum (Minneapolis, Minn).* 2017;23(4):989-1004.