

Sleep and Epilepsy

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Cognition

Sleep

Seizures

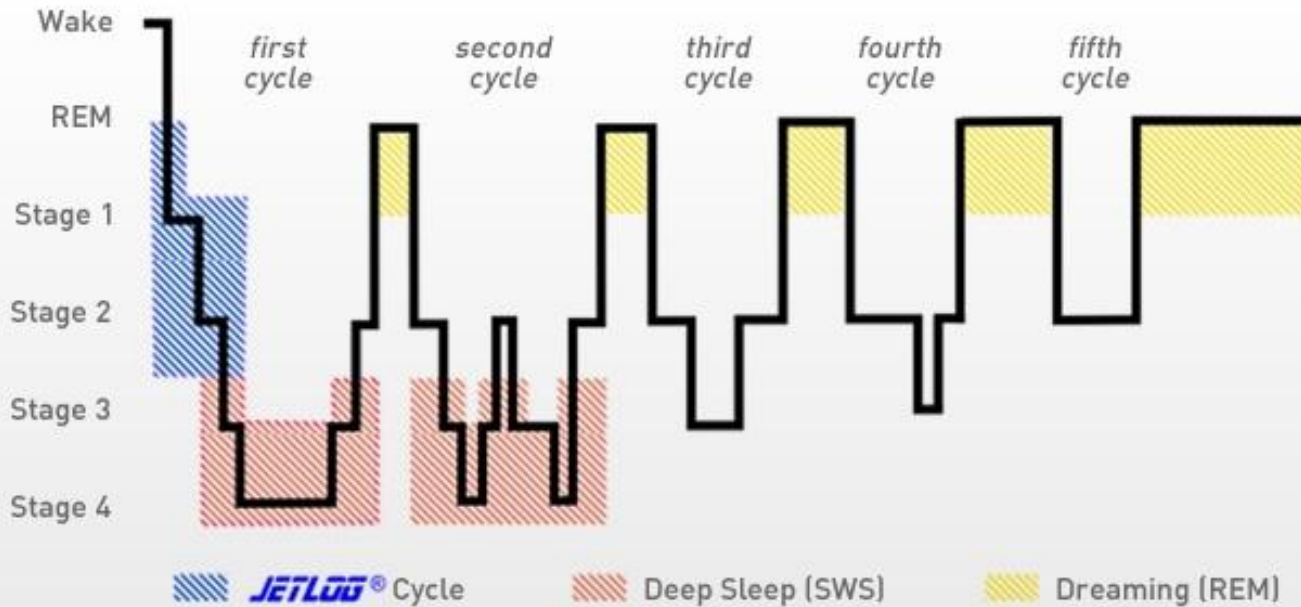
Behavior

Outline

- Most people spend 30% to 50% of their day sleeping
- Sleep can be divided into three stages:
 - Light sleep
 - Deep sleep
 - REM sleep

Sleep Physiology

Sleep Stages



Sleep Stages

- Disorders that disrupt sleep
 - Sleep apnea
 - Pain syndromes
 - Seizures
 - Periodic limb movement of sleep ...
- Disorders of sleep itself
 - Narcolepsy
 - REM behavior disorder
 - Parasomnia

Sleep Disorders

- Disturbance of the:
 - Amount of sleep
 - Quality of sleep
- Impact on level of daytime wakefulness
- Impact on cognitive function
- Impact on behavior

Impact of Sleep Disorders

- **Question:** What actually happens in the brain during sleep?

- **Answer:**

Why do we need sleep?

- ? The brain rests ?
- Memory consolidation
- Other ...

What happens during sleep

- In most people, seizures and seizure activity occurs more commonly during sleep
- Drowsiness and Light sleep mostly
- **Why?**
 - We don't know
 - Probably because brain waves are
 - Not active (awake and Rem)
 - Not slow enough (deep sleep)

Seizures

- **What do we know?**

- Sleep deprivation lead to more seizures and more seizure activity on EEG
- Patients with epilepsy who have a sleep disorders, like sleep apnea, are more likely to have intractable seizures
- Treatment of sleep disorders usually improves seizure control

Seizures and Sleep

- Excessive daytime sleepiness
- Snoring and apneas
- Frequent jerking during sleep
- Sleep walking and sleep talking
- Excessive movements during sleep
- Memory and attention difficulties
- In children, hyperactivity.

When to suspect a sleep disorder?

- Sleep study:
 - Overnight polysomnogram
 - Overnight study in the sleep labs
 - Monitoring of:
 - Brain waves
 - Heart rate
 - Breathing
 - Muscle activity
 - Multiple Sleep Latency Test (nap test)
 - 5 consecutive naps
 - Assess the amount of daytime sleepiness

Evaluation for sleep disorders

- In patient with epilepsy
 - Evaluation for a sleep disorder should be done if the patient has the right symptoms
 - Treatment of the sleep disorder often leads to marked improvement in seizure control
 - In children, sleep disorder sometimes manifest as behavioral and learning problems. Treatment can improve both.

Seizures in sleep disorders

- Many patients with epilepsy have disrupted sleep
- This is usually caused by:
 - Nighttime seizures
 - Nighttime seizure activity
 - Side effects of seizure medications
 - Depression and anxiety

Sleep in patients with epilepsy

- The most common sleep symptoms in patients with epilepsy are:
 - Insomnia:
 - Trouble falling asleep
 - Frequent night time arousals
 - Excessive sleepiness:
 - Frequently due to side effects of medications
 - Sometimes due to sleep disruption from nighttime seizures and seizure activity

Sleep in patients with epilepsy

- The relationship between sleep and seizures is very complex
- Memory, attention difficulties and sleepiness can be due either to:
 - Seizure medications
 - Lack of proper sleep
 - Nighttime seizures and seizure activity
 - Specific sleep disorder
- The correct diagnosis is essential!

Attention

- In some patients, the EEG reveals very frequent spikes (seizure activity) during sleep, with minimal seizure activity while awake
- **NOTE:** Routine 20 minute EEG usually do not reveal this activity
- Overnight EEG is necessary to capture and quantify this activity

Nighttime seizure activity

- Recent evidence suggests that patients, especially children, with frequent nighttime spikes may develop:
 - Cognitive problems
 - Learning difficulties
 - Behavioral problems

Significance

- Successful treatment of the abnormal activity usually results in improvement
- Treatment options include:
 - Seizure medications (not all medications are equally effective for seizure activity)
 - Diet therapy

Treatment

- The relationship between epilepsy and sleep is complicated
- Sleep disorders can make seizures difficult to control
- Seizures and seizure activity can lead to disruption of normal sleep
- Sleep disorders and epilepsy can present with similar symptoms
- Proper diagnosis is essential
- Treatment is frequently effective

Conclusion

Thank You