



EPILEPSY & The Facts

Sleep and Epilepsy

What happens when you go to sleep?

When you fall asleep, you don't actually stay in the same state all night long. You in fact cycle through a series of three states: dreaming sleep, non-dreaming sleep, and wakefulness. Dreaming sleep is when your mind is very active but your body is in a deep sleep state. During dreaming sleep, you have no tone in your muscles so you are unable to move and act out your dreams. If you are awakened from dreaming sleep, alertness returns relatively briskly. Non-dreaming or slow wave sleep itself has four stages, from the light stage we go into just as we're falling asleep, to the fourth stage of very deep sleep. In stage four, your brain waves on an electroencephalogram or EEG monitor would look very slow and synchronized (or regular), which is why it's called slow-wave sleep. In normal sleep you also have five to seven short periods of wakefulness per night, although you don't remember waking up.

What is a normal sleep pattern?

The deep stages of slow-wave sleep mostly occur in the first half of the night, whereas dreaming sleep occurs periodically but mainly in the second half of the night. You have arousals or periods where you briefly wake up, all night long. So you will have more deep, slow wave sleep at the beginning of the night, and then you have an arousal and then you might have some less deep sleep, an arousal, and then less deep sleep, and so on. You will have six to nine cycles throughout the night.

How do sleep patterns change as we age?

Babies nap frequently throughout the day and spend 50 per cent of their sleeptime dreaming. Infants and children also have a lot of refreshing and restoring slow-wave sleep and that's where the expression "sleeping like babes" comes from. After the age of five, children stop sleeping in the daytime and consolidate their sleep at night. Teenagers are a sleepy bunch because they have a relatively high need for sleep while their lifestyle does not allow them to get the sleep they require. Adults spend only 20 per cent of their sleep dreaming. As adults age they have less slow-wave sleep, but they also have less need for sleep overall.

What is the relationship between sleep and epilepsy?

From ancient times, scientists have noticed that a lot of seizures in people with epilepsy happen at night. Sleep and seizures are common bedfellows. Sleep tends to promote seizures. Sleep deprivation does too. That is why if you have an awake EEG test and it doesn't show evidence of epilepsy, your neurologist will often do a sleep-deprived EEG. It may bring out abnormalities that aren't seen in the awake state.



How can sleeping affect epilepsy?

During non-dreaming sleep, your brain produces the slow brain waves that form a very synchronized (or regular) electrical pattern on the EEG. This synchronized pattern of non-dreaming sleep is conducive to the production of epileptic discharges, which are the firing together of too many neurons in a synchronized burst of abnormal electrical activity. These epileptic discharges may not be sustained enough to cause a change in behaviour or movement that is a full seizure. They may instead be brief inter-ictal (meaning 'between-seizure') discharges. In dreaming sleep, you don't get seizures. You also don't get very many epileptic discharges.

How common is having seizures during sleep or upon awakening?

Forty-five percent of people with epilepsy have a form of sleep epilepsy, whereas 34 per cent have seizures upon awakening and 21 per cent have diffuse seizures (while both awake and asleep).

Do people get different kinds of seizures in their sleep?

Yes, although partial seizures are more common during the day than at night. People with either Juvenile Myoclonic Epilepsy or Absence Epilepsy will often have seizures just after waking or one or two hours after awakening. Tonic-clonic (grand mal) seizures usually occur either right after you go to bed during slow wave sleep, or right after you wake up. People who have this pattern usually have a good prognosis and may not develop seizures when they're awake. But seizures which are caused by a scar, lesion or brain abnormality in the frontal lobe of the brain are often hard to control. Seizures that come both night and day--while the person is awake and when they are asleep—can be the most difficult to control.

How does having epilepsy affect your sleep pattern?

There are a number of different ways your sleep can be impacted by your seizure disorder. When you have epilepsy, there can be a decrease in dreaming sleep. There can be a tendency to wake up after falling asleep rather than just sleeping through the night. An increase in the instability of the sleep state-- with more cycles and a less consolidated or smooth sleep—is a possibility which might in turn lead to some daytime fatigue. Or an increase in the lighter stages of slow wave sleep and less of the deeper and more restful stages can also cause daytime sleepiness. There can be less of the sleep spindles that are a part of the normal slow wave sleep. It may take you longer to fall asleep if you have epilepsy. Not everyone with epilepsy has all these changes. Whether or not you will experience any of these sleep problems depends on the seizure type, what is causing the seizure, what medications you are on and how well controlled your seizures are.

Can anti-convulsant medication affect my sleep?

We don't really have a lot of information on how the different anti-epileptic medications can affect sleep. We know that Carbamazepine or Tegretol can increase daytime sleepiness in the short term, as can Valproate or Epival. The majority of people on these drugs do not feel chronically tired. Phenytoin or Dilantin and Phenobarbital can help you fall asleep quicker. On the other hand, Phenobarbital can cause irritability especially in children that can interfere with falling asleep. Nitrazepam or Mogadon, one of the benzodiazepines, can cause an increase in stage two slow wave sleep. We don't yet have any good data on the effects of the new drugs like Vigabatrin, Gabapentin, Lamotrigine or Topiramate on sleep. What is important to remember is that if the drug is working for the epilepsy and the seizures are controlled, then probably the sleep is the best it's going to be. It's not very often that an anti-convulsant will be changed just because someone is having sleep problems.

Does sleep cause the medication level in my system to drop?

Once you are on a therapeutic level of medication, the medication level should basically stay the same throughout the entire 24-hour period.

Can epilepsy lead to a sleep disorder?

The changes to the normal sleep pattern that can happen with epilepsy described above are unlikely to be permanent. But people with epilepsy can also have sleep disorders that are separate from their epilepsy. For example, you can also have a sleep disorder like sleep apnea where you have pauses in your breathing at night, restless leg syndrome where you kick a lot at night, sleep walking, or sleep terrors (more likely in children).

What is a sleep disorder?

There are three things that can happen: hypersomnia (or being too sleepy), insomnia (where you have trouble falling asleep), or parasomnia (when something unusual happens during your sleep). Unusual events like night terrors, sleep walking, sleep talking and bed-wetting are what we mean by parasomnia. They occur upon a sudden arousal to wakefulness from stage 3 or 4 of slow-wave deep sleep, when you're half-awake but still half-asleep.

How can we distinguish epilepsy from a sleep disorder?

Sleep disorders may resemble seizures, making nighttime episodes sometimes confusing to diagnose. Even when we are sure the person has epilepsy, it's sometimes hard to tell the difference between nocturnal seizures and a sleep disorder. Physicians look for clues. Is there a family history of sleep disorder? What do the nocturnal events look like and when in the sleep cycle do they occur? Do they cause daytime fatigue?

Night terror, other parasomnia or a seizure?

It's sometimes hard to tell the difference between a nocturnal seizure and a parasomnia such as a night terror, bedwetting, sleep talking or sleep walking. A night terror usually consists of a child sitting up in bed, not knowing where they are, suddenly starting to scream or call out, looking around, bewildered, half awake and half asleep. A seizure, on the other hand, typically involves difficulty breathing, some clonic or rhythmic jerking activity, an inability to talk, and the person may bite their tongue or hurt themselves in some way. Another clue might be the timing of the event. A parasomnia will often be in the first third of the sleep whereas a seizure can happen at any time throughout the night, but often just before or after waking in the early hours of the morning.

Sleepiness or epilepsy?

One category of sleep disorder is hypersomnia—being too sleepy. Is this sleepiness because of epilepsy or because of something else? Sleepiness can indeed be caused by having a lot of seizures which are waking you up and disrupting your sleep, or it can be part of the disruption to the normal sleep pattern caused by having epilepsy which was described above.

Sleep apnea or epilepsy?

Sleep apnea includes pauses in breathing, indicated by gasping, snoring or difficulty in breathing during the night. It is more common in men than in women, and often occurs in larger people whose throat muscles and fat tissue cause an obstruction while they're sleeping. These pauses in breathing can easily be confused with seizures. In fact, having apnea can trigger seizures. Having seizures can also trigger apnea; it can work either way.

Insomnia or epilepsy?

If you have trouble falling asleep or are awakened throughout the night, and if your insomnia isn't due to any medical or psychological problems or a genetic predisposition, it could be seizures that are causing the arousals.

Sleep starts or epilepsy?

Everyone's muscles jerk as they fall asleep. These are called sleep starts or myoclonic jerks. While they are often mistaken for seizures, in fact they are a normal part of falling asleep.

Nightmares or epilepsy?

Some seizures can be confused with nightmares. However, it is uncommon to have nightmares starting in adulthood. People who wake up thinking there's something crawling on them, or who are cold or sweating can be having a type of autonomic seizure.

When should an overnight sleep study be done at a sleep clinic?

Sleep studies can be helpful in differentiating an epileptic from a non-epileptic nighttime event. They are used to diagnose sleep disorders that may be mistaken for epilepsy, for example sleep apnea. They are used to investigate patients complaining of excessive daytime sleepiness that cannot be explained by their anti-convulsant medication. And finally, an overnight sleep study is used to document sleep disturbances and sleep architecture in people with epilepsy, which may be causing chronic sleep deprivation, and, in turn, more seizures. This is so that proper treatment can be started. During a sleep study in a sleep lab, the patient's brainwaves, breathing, heartbeat, muscle tone and eye movements are monitored and the patient is videotaped during sleep.

Would an inadequate or restless sleep cause daytime seizures?

Yes. Increased seizure-related activity during sleep may lead to sleep deprivation, which may, in turn, increase daytime seizures.

Can a person with epilepsy take sleeping pills to help them sleep?

There is no absolute contra-indication to taking a sedative if you have epilepsy, but you need to check with your doctor before taking these pills. People with breathing problems at night should not take sedatives. Insomnia is very difficult to cure and people develop a tolerance to sedative hypnotic drugs after taking them for a short while. There is no drug that you can take on a long-term basis that will put you to sleep and let you feel quite rested during the day. That is why a behavioural approach is recommended.

How can I improve my sleep?

- Avoid stimulating activity (like computers or parties) just before the sleep period.
- Do not get into bed until you are drowsy.
- Get up at the same time each morning, including weekend mornings.
- In general, adults do not need naps, however elderly people and some people on medication for epilepsy may need naps during the day.
- Exercise regularly but avoid strenuous exercise after 6 p.m.
- A light carbohydrate snack (e.g. crackers and milk) may promote sleep.
- Sleep environment should be cool, with minimal light and noise.
- Curtail or eliminate the use of alcohol; no alcohol less than two hours before bedtime.
- Curtail or eliminate the use of caffeine; no consumption of caffeine after 4 p.m.
- Curtail or eliminate the use of nicotine; do not smoke within four hours of retiring.