# New research suggests we also dream during non-REM sleep cycles

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(Medical Xpress)—A team of researchers with members from institutions in the U.S., Italy and Switzerland has found evidence that suggests people have dreams during both REM and non-REM sleep

cycles. In their paper published in the journal *Nature Neuroscience*, the team describes experiments the conducted with volunteers wearing EEG caps and what was revealed.

For many years, there has been a consensus among sleep experts that humans experience dreams only during REM sleep cycles. Now, it appears that such assumptions might be incorrect, as the researchers with this new effort found evidence of dreaming during other sleep cycles, as well.

To better understand sleep and when dreams truly occur, the researchers recruited 32 people who agreed to wear EEG caps as they slept in beds in a lab. Each was awakened at different times depending on EEG readings, and were asked if they were dreaming and whether they could recall details about it.

In looking at the data, the researchers found that many of the volunteers reported dreaming during non-REM cycles, though most of the dreams were more difficult if not impossible to remember. They also found a correlation between dreaming during both REM and non-REM cycles of low-frequency brain waves occurring in an area in the back of the brain they dubbed "the hot zone." This identification of a hot zone, the researchers claim, allowed them to predict when a person was dreaming.

The researchers next asked seven volunteers who were familiar with dream studies to spend between five and 10 nights in the lab sleeping with EEG caps on their heads. This allowed the researchers to monitor how much of the time people were dreaming and when—they report that they found that the volunteers dreamed approximately 71 percent of the time during non-REM sleep and 95 percent during REM cycles.

In yet another experiment, the researchers monitored 10 people as they slept and woke them at various stages of dreaming, which, they claim,

allowed them to see that people were better able to remember their dreams if there was activity in the prefrontal cortex (which prior research has shown is linked with building memories) as the dream was occurring.

**More information:** Francesca Siclari et al. The neural correlates of dreaming, *Nature Neuroscience* (2017). DOI: 10.1038/nn.4545


## Abstract

Consciousness never fades during waking. However, when awakened from sleep, we sometimes recall dreams and sometimes recall no experiences. Traditionally, dreaming has been identified with rapid eye-movement (REM) sleep, characterized by wake-like, globally 'activated', high-frequency electroencephalographic activity. However, dreaming also occurs in non-REM (NREM) sleep, characterized by prominent low-frequency activity. This challenges our understanding of the neural correlates of conscious experiences in sleep. Using high-density electroencephalography, we contrasted the presence and absence of dreaming in NREM and REM sleep. In both NREM and REM sleep, reports of dream experience were associated with local decreases in low-frequency activity in posterior cortical regions. High-frequency activity in these regions correlated with specific dream contents. Monitoring this posterior 'hot zone' in real time predicted whether an individual reported dreaming or the absence of dream experiences during NREM sleep, suggesting that it may constitute a core correlate of conscious experiences in sleep.