

Non-rapid eye movement sleep

Non-rapid [eye movement sleep](#) is supposed to play a key role in long-term [memory](#) consolidation transferring information from the [hippocampus](#) to [neocortex](#). However, [sleep](#) also activates epileptic activities in medial [temporal regions](#). A study of Lambert et al. investigated whether interictal hippocampal spikes during sleep would impair long-term memory consolidation.

They [prospectively](#) measured visual and [verbal memory](#) performance in 20 patients with epilepsy investigated with [stereoelectroencephalography](#) at immediate, 30-min and 1-week delays, and studied the correlations between interictal hippocampal spike frequency during waking and the first cycle of non-rapid eye movement sleep and memory performance, taking into account the number of seizures occurring during the consolidation period and other possible confounding factors such as age and epilepsy duration.

Retention of verbal memory over 1 week was negatively correlated with hippocampal spike frequency during sleep, whereas no significant correlation was found with hippocampal interictal spikes during waking. No significant result was found for visual memory. Regression tree analysis showed that the number of seizures was the first factor that impaired verbal memory retention between 30min and 1 week. When the number of seizures was below 5, spike frequency during sleep higher than 13/min was associated with impaired memory retention over 1-week.

The results show that activation of [interictal spikes](#) in the hippocampus during sleep and seizures specifically impairs long-term memory consolidation. We hypothesize that hippocampal interictal spike ¹⁾

¹⁾

Lambert I, Tramoní-Negre E, Lagarde S, Roehri N, Giusiano B, Fonseca AT, Carron R, Benar CG, Felician O, Bartolomei F. Hippocampal interictal spikes during sleep impact long-term memory consolidation. Ann Neurol. 2020 Apr 12. doi: 10.1002/ana.25744. [Epub ahead of print] PubMed PMID: 32279329.

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