Using EEG to Monitor Brain Wave Transitions Could Reduce Postoperative Cognitive Issues

New research using electroencephalogram (EEG) data was able to track transitions in patients’ levels of consciousness during general anesthesia—a finding that could help reduce cognitive problems after surgery, especially among older patients, the researchers reported in *Proceedings of the National Academy of Sciences*.

Common anesthetics that act on the brain’s inhibitory receptors cause patients’ brain waves to slow to rhythms known as slow-delta and alpha oscillations, leading to unconsciousness. Higher doses of these drugs, however, can cause a deeper state of unconsciousness in which brain activity periodically stops, or flatlines. This deeper state of unconsciousness is tied to postoperative cognitive disorders.

To understand the transition between these 2 states of unconsciousness, the researchers analyzed EEG data from 30 surgical patients and 10 healthy people who received the anesthetics propofol or sevoflurane. As the amount of anesthetic increased, alpha waves appeared on patients’ EEGs before decreasing in height and the time between slow waves increased as patients moved into the deeper state of unconsciousness. Decreasing the amount of anesthetic reversed the pattern. The researchers then used this information to develop indices that clinicians can use to measure real-time transitions in their patients’ degrees of unconsciousness.

- Emily Harris

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*Note:* Source references are available through embedded hyperlinks in the article text online.