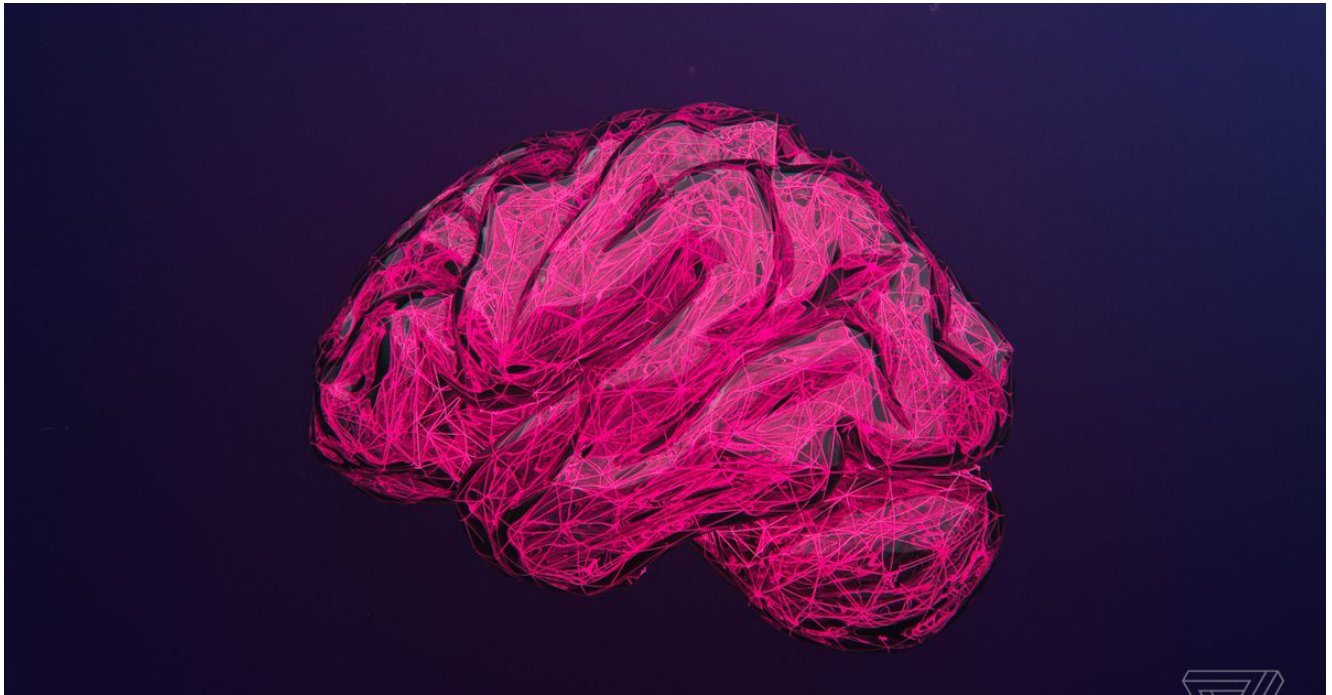


Anesthesia can help patients forget a disturbing memory



Giving patients an anesthetic can help them forget a disturbing memory, according to research published today in the journal *Science Advances*. It's the latest study to investigate the conditions that might prevent memories from sticking, and it could be a step toward finding a technique that helps people deal with harmful memories related to anxiety, trauma, or addiction.

Researchers showed 50 participants two different and unpleasant narrated slideshows. One was about kids being kidnapped, and the other was about a car accident, according to study author Ana Galarza Vallejo, a neuroscientist at the Technical University of Madrid. One week later, the scientists "reactivated" memories of only one of the slideshows by showing participants a picture from it and asking basic questions. Immediately afterward, all of the participants were given the anesthetic propofol and they underwent endoscopies, which usually only take a few minutes. (The participants had all been recruited from a hospital and were scheduled for

endoscopies anyway.)

"I like the proof of concept idea, but what do you do with this now?"

In the final step, the scientists tested all of the participants on how well they remembered both stories. Half were tested right after they woke up, and half were tested 24 hours later. Patients tested immediately afterward tended to remember both. Patients who were tested a day later did not remember the story that had been "reactivated" as well as the story that had not been reactivated. This suggests that the combination of the reactivation, anesthetic, and timing kept the memory from taking hold.

The paper is an interesting addition to growing research into how the mind holds on to memories, says Ravi Das, a psychologist at University College London who was not involved with the study. People used to think that once you learned something, you were stuck with it forever, Das explains. "We now know that when you retrieve memories under certain circumstances, there's a brief period – like two hours – during which those memories are unstable and you can interfere with them," he adds.

The challenge will be applying these limited results to real-life examples instead of a situation where scientists gave someone a disturbing memory a week ago. In his own research, Das is investigating whether similar techniques can help with cravings related to alcohol and drug addiction, which is a much more complicated endeavor. For example, they'll try to weaken memories of environmental triggers (like a particular place) that makes someone want to drink. "In our studies, we've had heavy drinkers and smokers. They've been drinking and smoking for 10 years. So it's a very different level of difficulty in reactivating and destabilizing a memory that is old," Das says.

Vallejo says that the team is interested in doing more trials

with these real-life examples, but other experts question the feasibility of using an anesthetic to erase traumatic memories. Michael Saladin, a professor at the Medical University of South Carolina who was not involved with the study, praised the clever idea of recruiting patients who were already going to undergo a routine anesthetic procedure. "But who the heck is going to use propofol for this type of intervention?" asks Saladin, who also studies memory retrieval and manipulation in the context of addiction. "I like the proof of concept idea, but what do you do with this now? How clinically useful is it to actually move forward with some version of this? The answer is, it's a pretty big question mark."

Both Saladin and Das say that many clinicians and patients might have concerns about receiving general anesthesia unless it's absolutely necessary, which is why plenty of similar research has used a drug called propranolol that's usually used to treat high blood pressure and doesn't require someone to lose consciousness to affect memories. Still, sometimes propranolol doesn't work either. That's why Saladin says it's important to investigate other drugs that might be helpful since there's little reason to believe that any given treatment will work under all conditions for all individuals.

Ultimately, plenty of questions remain, such as which drugs work for which people, how results differ by gender, and how to be really specific about the memory affected so that, as Das puts it, "helpful memories don't go along for the ride and get weakened." Saladin adds that it's a young field, so there's not an enormous amount of data available, but the good news is that if it all pans out, patients wouldn't have to take the medication chronically. Rather, the interventions would be "one of the most ideal uses of medications": briefly and strategically.

<https://www.theverge.com/2019/3/20/18274563/memory-neuroscience-anesthesia-ptsd-addiction-stress-retrieval-reconsolidation->

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