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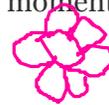
# Brains Of Dying Rats Yield Clues About Near-Death Experiences

What is a near death experience?

A burst of brain activity just after the heart stops may be the cause of so-called near-death experiences, scientists say.

to kill painlessly

The insight comes from research involving nine lab rats whose brains were analyzed as they were being euthanized. Researchers discovered what appears to be a momentary increase in electrical activity in the brain associated with consciousness.



Experiments could apply to humans even though it was done on animals.

Although the experiment relied on animals, the results could apply to humans, too, the researchers say.

"Now science tells us the experiences really could be real for these individuals, and there is actually biological basis for that," says Jimo Borjigin, of the University of Michigan in Ann Arbor, who led the research. "There's a scientific basis in their brain. It's all really happening in their brain during this very early period of cardiac arrest."



People regularly report having powerful experiences when they come close to dying. They often say they had an overwhelming feeling of peace and serenity. Frequently they describe being in a dark tunnel with a bright light at the end. Many report meeting long-lost loved ones.

These are repeated patterns.

"Many of them think it's evidence they actually went to heaven — perhaps even spoke with God," Borjigin says.

Borjigin wanted to find out if there was something happening in the brains of these people who had close calls with death that could help explain these experiences.

Do NDEs really come from the brain?

"If the near-death experience comes from the brain, there's got to be signs — some measurable activities of the brain — at the moment of cardiac arrest," she says.

Is it really different from studying it in animals?

But it's really hard to study this in people. So Borjigan and her colleagues decided to study rats.

a conductor, not necessarily metallic, through which a current enters

They implanted six electrodes into the brains of nine rats, gave the animals lethal injections and collected detailed measurements of brain activity as they died.

"We were just so astonished," Borjigan tells Shots.

Just after the rats' hearts stopped, there was a burst of brain activity. Their brain suddenly seemed to go into overdrive, showing all the hallmarks not only of consciousness but a kind of hyperconsciousness to push or carry to excess any distinguishing feature or characteristic

acutely aware

"We found continued and heightened activity," Borjigan says. "Measurable conscious activity is much, much higher after the heart stops — within the first 30 seconds."

Borjigan and her colleagues think they essentially discovered the neurological basis for near-death experiences. "That really just, just really blew our mind. ... That really is consistent with what patients report," she says.

Patients report that what they experienced felt more real than reality — so intense that it's often described as life-altering.

Borjigan continues to believe that people experience these because their brains to take in everything going on around

But Borjigan thinks the phenomenon is really just the brain going on hyperalert to survive while at the same time trying to make sense of all those neurons firing. It's sort of like a more intense version of dreaming.

a secondary or incidental product

This is what Borjigan thinks.

"The near-death experience is perhaps is really the byproduct of the brain's attempt to save itself," she says.

Other scientists praised the research, which is being published in the *Proceedings of the National Academy of Sciences*.

title

# Near-Death Experiences are Lucid Dreams, Experiment Finds

easily understood

In a new exercise by a California organization that studies lucid dreaming, volunteers have been conditioned to dream near-death experiences, including the classic scenario of flying toward a light at the end of a tunnel. The researchers say their experiment demonstrates that these heavenly visions must be products of the human mind rather than supernatural phenomena.

This scenario is talked about frequently.

science views

In the sleep experiment at the Out-Of-Body Experience Research Center in Los Angeles, four groups of 10 to 20 volunteers were trained to perform a series of mental steps upon awakening during the night that might lead them to have out-of-body experiences. If able to "separate" from their bodies, they were then conditioned to try dreaming about floating through a tunnel toward a bright light. Eighteen of the volunteers said they were able to dream such an experience.

"Some of the test subjects not only succeeded in reproducing the out-of-body flight through a tunnel, but also enjoyed the ecstasy typical of the experience, and even flew all the way to the light and met their deceased relatives there," center leader Michael Raduga stated in a press release about the work, which has not been published in a peer-reviewed journal.

Patterns

subtitle

## History: Prehistoric Artists Used Pointillism 38,000 Years Ago

More than 8 million Americans have had a near-death experience, and they most often occur during states of anesthesia-induced sleep, according to the center. Prior work by neurologists, including Kevin Nelson of the University of Kentucky, suggests that NDEs

NDEs are common when people are under anesthesia.

patterns

are indeed generated by the same brain mechanisms that cause lucid dreams. Nelson's research shows that both types of experiences arise when part of the brain called the dorsolateral prefrontal region — our "logical center," which is usually active only when we're awake — becomes active during REM sleep, allowing extremely vivid dreams that seem to be happening in real life. He calls the transitional state between dreaming and wakefulness a "borderland of consciousness" and believes it is in this mixed state that lucid dreams and NDEs occur.

of, relating to, or affecting the back and the side

Are these really dreams?

With Nelson's research in mind, Raduga designed his experiment to determine if volunteers could be coached to dream up NDEs when in the transitional phase between sleep and waking. This would demonstrate that reports of NDEs, which are commonly cited as proof of the supernatural, really are just lucid dreams. ???

Volunteers who successfully generated NDEs described their experiences for the researchers. One participant, identified by the center as Nadezhda S., stated: "I was able to leave my body after a couple of tries. Now that I was out of my body, I wanted to see the tunnel and it immediately appeared in front of me ... Once I flew to the end of that tunnel ... I saw my deceased husband there in the spirit. We spoke for several minutes. His words, touch, bearing, and feelings were real, just like during his life. Later on, when I felt it was time to leave, I went up to the tunnel, jumped and gently landed in my body."

This is someone's personal experience.

Nelson said conclusions from the research should be "cautiously drawn" until the findings pass the peer-review process, but they are nonetheless well-aligned with prior research on NDEs. "Lucid dreaming can be conditioned and bears an uncanny similarity to near-death," Nelson told [Life's Little Mysteries](#). "Indeed, Raduga's study demonstrates the similarity of near-death and lucid dreaming. Evidence from many

mysterious; arousing superstitions fear or dread; uncomfortably strange:



sources converges to support that lucid dreaming and near-death use similar brain mechanisms but in different circumstances."

The research may have implications for those who believe in the afterlife. "NDE, as the most trusted reason for believe in life after life, may be just the **result of spontaneous and hyper-realistic lucid dreams**, induced by **narcosis** or brain damage during dying," Raduga wrote in an email. "This means that NDEs aren't evidence of life after life."

characterized by stupor; stuporous