



COVER  
STORY



# DEATH DEFYING

BY ALEX ORLANDO

**AN ESTIMATED 9 MILLION PEOPLE IN THE U.S. ALONE HAVE HAD A TRANSFORMATIVE **NEAR-DEATH EXPERIENCE**. SCIENTISTS ARE GRAPPLING WITH WHAT'S HAPPENING INSIDE THEIR HEADS.**

**A**t the end of Plato's *Republic*, the philosopher Socrates shares the myth of Er, a warrior who was killed in battle. Twelve days later, the man comes back to life to tell of the other world he had seen. His soul, he says, left his body to arrive in "a mysterious place," where others were judged for their deeds and luminous beings descended from above.

While Er's experience sounds like the stuff of legends, strikingly similar accounts have been reported by real people, stretching across cultures and entire eras in human history. From ancient Greece to the present day, people who survive brushes with death often recount a sense of shedding the physical body and entering another realm or dimension. Some describe intense feelings of peace, passing through a dark tunnel toward a bright light, and reexperiencing life events in rich, panoramic detail. Scientists and doctors categorize these events as near-death experiences, or NDEs.

While there is no widely accepted definition of NDEs, the term typically refers to the mystical, profound experiences that people report when they are close to death. They're most common in patients who survive severe head trauma or cardiac arrest. In other words, "conditions in which you would die, and stay dead, unless somebody

LEFT: DANIEL SERRA/ISTOCK; TOP: BING STUDIO/SHUTTERSTOCK

People who have NDEs are often fundamentally changed by their experience.



In a 2001 study of 344 patients who were successfully resuscitated in Dutch hospitals, 18 percent reported an NDE.

instituted emergency medical procedures to help you," says Bruce Greyson, a psychiatrist at the University of Virginia who has studied NDEs for nearly 50 years.

Such events happen more often than you might think: In the U.S., an estimated 9 million people have reported an NDE, according to a 2011 study in *Annals of the New York Academy of Sciences*. These individuals — or NDErs — are often deeply changed afterwards. Some find they have a greater gusto for life, more compassion for others and a diminished fear of death. Others struggle to readjust to everyday routine, baffling loved ones with their new beliefs or divorcing their spouses. Even blissful or euphoric NDEs can leave survivors feeling angry or dismayed to be alive again.

In the past 40 years, more and more

scientists have probed the phenomenon. Yet despite almost half a century of investigation, researchers still don't agree on what's happening during NDEs, or whether they can be explained at all. Some attribute them to hallucinatory flights of imagination, the last gasps of a dying brain. But others are exploring what NDEs may unlock about our understanding of human consciousness — and the possibility that it continues even after our bodies and brains power down.

#### RETHINKING DEATH

What happens to us after we die? The question has lingered over human

activity for at least 34,000 years, given records of ancient peoples in Sungir, Russia, burying their dead with ivory beads and other ornamental accessories, which suggests some conception of life beyond the grave.

Similarly, reports of NDEs have been referenced by humans wrestling with the possibility of an afterlife since antiquity. They've cropped up in the Egyptian *Book of the Dead*, the *Bardo Thödol* (or the *Tibetan Book of the Dead*), the Bible and even the works of Ernest Hemingway.

It wasn't until the 18th century that a physician first recorded his own observation — and scientific analysis — of the phenomenon. Around 1740, the first medical report of an NDE came from a military doctor

from northern France. Pierre-Jean du Monchaux describes a patient who lost consciousness after having too much blood drawn to treat a fever. The patient later reported that he "saw such a pure and extreme light that he thought he was in Heaven [...] and affirmed that never of all his life had he had a nicer moment." Du Monchaux speculated that too much blood flow to the brain had caused these strong, serene feelings, comparing it to similar reports from people who had survived drowning, hypothermia and hanging.

More than 200 years would pass before research into NDEs really took off. In his 1975 book, *Life After Life*, psychiatrist Raymond Moody coined the term "near-death experiences" to describe these episodes. The label stuck, as did Moody's descriptions of the common features reported by survivors, including immense feelings of peace and love, meeting dead loved ones and reaching a barrier or "point



A 19th-century etching of Robert Blair's poem "The Grave," drawn by Italian illustrator Luigi Schiavonetti, depicts a soul leaving the human body.

of no return." The research that's piled up since Moody brought NDEs into the spotlight has largely affirmed this original description.

For much of human history, death was seen as a simple — and permanent — affair. "When people died, whether they had a car accident or were at war or had an infection, the final thing that would occur is that their heart would stop," says Sam Parnia, director of critical care and resuscitation research at New York University Langone Health medical center. "That was irreversible."

Since the heart is intimately intertwined with the functioning of the lungs and brain stem, any process that leads one organ to stop working will inevitably lead to the termination of the other two. In short, if any of those three vital organs ceases functioning, death soon follows. Even today, doctors still often declare death at the precise point in time when a patient's heartbeat comes to a halt.

But in 1960, just 15 years before Moody would popularize the term NDEs, physicians combined mouth-to-mouth breathing with chest compressions to create cardiopulmonary resuscitation. CPR, as we call it today, has made death far less black-and-white. The arrival of CPR, as well as the emergence of intensive-care medicine, enabled people who had passed the threshold of biological death to come

back, kept alive through life-support machines, like ventilators.

Parnia thinks that, someday, scientists might be able to push the threshold of death even further. "Actually, the cells inside your body don't die when you die," he says. A 2019 discovery showed how brain activity could be restored in pigs more than 10 hours after the animals were killed, a study that Parnia says was worthy of a Nobel Prize. Even when all signs of life have vanished, and brain cells have been deprived of oxygen, those underlying cells don't die for many hours, and possibly even days. In other words, says Parnia, what we call the "irreversibility" of death is simply a lack of medical means to bring someone back to life.

Advances in medical resuscitation have helped fuel NDE studies, since researchers can now analyze data





from large cohorts of cardiac-arrest survivors. For example, in a 2001 study of 344 patients who were successfully resuscitated in Dutch hospitals, 18 percent reported an NDE. More recent studies have even attempted to illuminate what happens to our consciousness when we die, a mystery that's kept humans awake at night for thousands of years.

#### FLOATING ABOVE

Before John was 3 years old, his heart stopped. His grandmother recalls the chaos that followed: People rushing to help, chest compressions, John remaining lifeless and blue. He was put in an ambulance and raced off to the hospital.

After John had been revived and discharged from the hospital, one day, while playing, he said, "Grandma, when I died, I saw a lady." John's grandmother asked her daughter, John's mom, whether anybody had said anything to him about his cardiac

arrest. "No, absolutely not," she answered. But over the next several months, John still continued to talk about what he'd experienced. "When I was in the doctor's car, the belt came undone and I was looking down from above," he said.

Some features of NDEs — like those in John's case report, detailed in a 2014 paper written by Parnia — seem to defy explanation. Parnia, who also led a four-year study of more than 100 cardiac arrest survivors, notes that



some NDEs see scenes from their lives flash before their eyes, a phenomenon researchers call the *life review*. He also says that most tend to focus on their intentions toward other people. "You end up judging yourself based on your worth as a human being," Parnia says. "The part that's particularly inexplicable is they end up experiencing this through the prism of the other person's perspective." Beyond that, many of these events depict things that you'd normally be unable to remember, like moments from early childhood.

Another seemingly inexplicable NDE hallmark is the out-of-body experience, or OBE. Many people report that their consciousness seems to float above their body — and, in rare cases, observe and remember what's happening around them with startling accuracy. In Greyson's 2021 book, *After*, the psychiatrist describes how Holly, a patient of his who'd overdosed, was able to recall precise details from his conversation with her roommate (in another room, for that matter) while she was unconscious. Holly even noted the striped tie that Greyson had dribbled spaghetti sauce on. "I was totally flustered by it," Greyson says. "The only way it could have happened was if she had left her body, and that made no sense to me at all."

Parnia's study of cardiac arrest survivors across 15 hospitals, dubbed AWARE and published in the journal *Resuscitation* in 2014, was partially an attempt to figure out a way to test the validity of such reports. Basically, were patients really witnessing actual events that had occurred after they'd been declared dead? To study survivors'

claims, participating hospitals put dozens of shelves in their emergency departments and ICUs. Each had a different image facing up, including pictures of religious symbols, animals and newspaper headlines, only visible to someone peering down from the ceiling. In theory, patients might see the image if their consciousness had somehow decoupled from their body in the emergency room.

Advances in medical resuscitation have helped fuel NDE studies, since researchers can now analyze data from large cohorts of cardiac-arrest survivors.

Among the 101 survivors who were interviewed multiple times, nearly half reported that they had no awareness or memories at all while they were unconscious. Forty-six percent reported detailed memories, like seeing animals and plants or feeling intense fear, not typically associated with NDEs. And 9 percent of them had NDEs, roughly the same rate that's been reported by cardiac arrest survivors in other studies. The study authors say that one patient, a 57-year-old man, accurately described sights and sounds during his

own resuscitation from a vantage point at the top corner of the room. Since this man was in a room without the shelves present, however, he wasn't able to describe the pictures they held. While none of the patients studied were able to name images on the shelves, only about 22 percent of the cardiac events occurred in those modified rooms.

Still, the study authors suggest that these vivid experiences, both NDEs and other memories, took place during "clinically undetectable consciousness," citing other examples, such as people

## DYING, FROM THE PATIENT'S PERSPECTIVE

### As hospice physician

Christopher Kerr puts it, dying is a paradox. "You're physically declining, but spiritually, you're very much alive," says Kerr, CEO of Hospice & Palliative Care Buffalo. "We view dying as this

medical phenomenon, when it's ultimately this human experience that is very rich." By speaking with hospice patients, Kerr and his colleagues have explored the nature of over 1,500 inner, subjective events — called end-of-life

experiences, or ELEs — that many people go through as they approach death. A key difference from an NDE is that an ELE occurs days, weeks and even months before signs of life fade.

The researchers found that nearly 90 percent of

patients reported having at least one ELE, which can include extraordinarily vivid dreams or visions. These dreams often featured both living and deceased loved ones. "The closer you get to death, the more likely you are to see

people who are deceased who you loved," says Kerr. The frequency of ELEs also increased as people came closer to death. Overall, more than 60 percent of patients found their dreams comforting, while around 19 percent reported

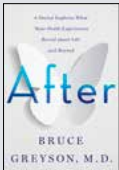
that they felt distress.

Kerr notes that, unlike with NDEs, the patients are often healthy and lucid for these events. "Some of these people are driving, doing their taxes and living alone," he says. "You can't attribute it to

neurotransmitter flux or anything like that."

In the end, ELEs tend to be life-affirming, according to Kerr. "[The experience] lessens the fear of death," he says. Even the negative aspects of someone's life can take on profound

meaning. Such was the case for one aging veteran battling PTSD and survivors' guilt. "In his end-of-life dreams, he was comforted by seeing soldiers," says Kerr. "Then he could sleep. He found peace." — A.O.



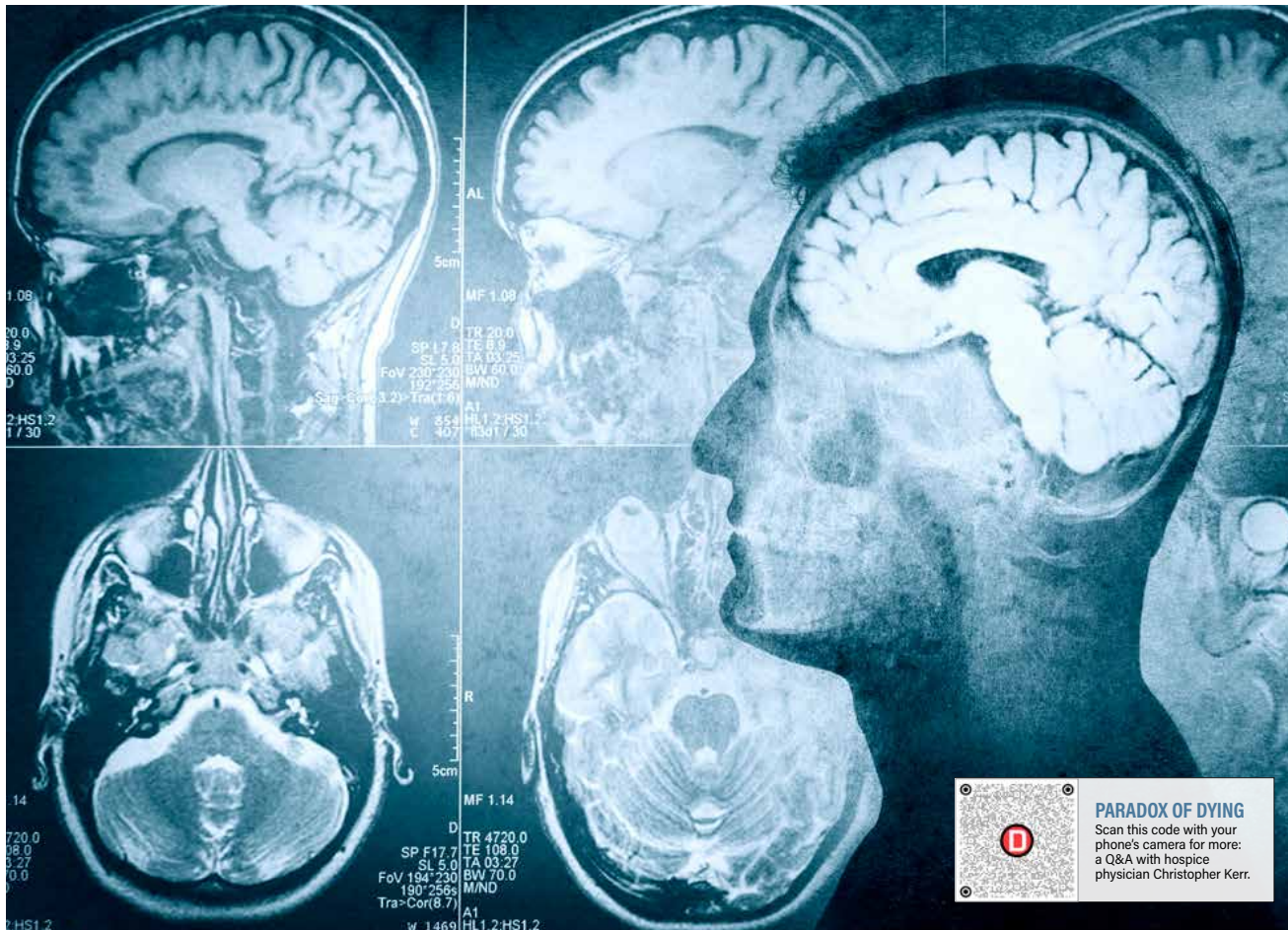
Greyson's 2021 book, *After: A Doctor Explores What Near-Death Experiences Reveal About Life and Beyond*.

who have awareness of events while in a vegetative state. "For the first time ever, we were able to show that consciousness does occur when the heart stops [and] the brain shuts down," says Parnia, who adds that this research begs the question: How can someone make memories, and have lucid, well-structured thought processes, when their brain is either severely damaged or even not working at all?

### A SKEPTICAL LENS

There's no denying the transformative power of NDEs. These deeply mystical experiences can prompt major psychological and spiritual changes, like enhanced empathy and less concern for wealth or social status. Beyond that, simply knowing about them can trigger big life changes. Greyson points to research on students who have studied NDEs; even a year after learning about them, they often became more caring and altruistic. "The idea of the near-death experience touches something that we all know deep in our being," he says. "We are not here alone. We are part of something greater than ourselves."

Yet not all NDEs are positive. While euphoric NDEs get the most press, other experiences can be deeply disturbing, dominated by feelings of terror, isolation and agony. And while NDEs often precipitate personal growth, they can also trigger symptoms of PTSD and cause major disruptions in people's lives. "I've seen lots of careers end," says Greyson. "In addition to that, many people were so enraptured by their NDE that they were depressed or angry to be back alive again."



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Regardless of their impact, some scientists and scholars still view NDEs through the lenses of psychology, biology and neuroscience. John Martin Fischer, a philosopher at the University of California, Riverside, and co-author of *Near-Death Experiences* says that one explanation for the universal similarities in NDE reports is often ignored. "It's not that we're in contact with an otherworldly realm," he says. "We're all similar. Humans have similar developmental

histories, psychologies and similar brains." Beyond that, all humans have to come to terms with the looming threat of death. When we're in a situation that seems like it might lead to our death, Fischer continues, we react in similar ways. "The biochemistry and the neurophysiology interacts with our psychology in complex ways to produce similar reactions," he says. Kevin Nelson, a neurologist at the University of Kentucky Medical Center, argues that NDEs can be slotted neatly into a neuroscientific framework. Like Fischer, he says that these are complex

PORTRAIT: JEN FARELLO; SCANS: THEIF/SHUTTERSTOCK

PORTRAIT: COURTESY OF JOHN MARTIN FISCHER

phenomena, but also notes that many of the well-known features of NDEs can also be triggered by situations where someone's life isn't in danger. "The context of the experience — feeling threatened — may be as important as the actual medical threat," says Nelson, who also wrote *The Spiritual Doorway in the Brain*. He points out that the experience of fainting can generate similar effects: "Done in the safe confines of a laboratory, [it] will induce identical elements to a near-death experience." A study published in *The Lancet* in 1994 found that syncope, or fainting, also prompted NDE staples

like feelings of peace, entering another world and being surrounded by light. That includes out-of-body experiences, too. Though often a feature of NDEs, they also occur in the general population; one survey of 13,000 people found that almost 6 percent had had an OBE. They've been reported by people with epilepsy and sleep paralysis. They can even be triggered in the lab by zapping the brain's temporoparietal cortex, which regulates how the body perceives itself, with a small electric charge. Most of the time, says Nelson, they occur during the transition between wakefulness and rapid

eye movement (REM) stages of sleep. Nelson thinks that key characteristics of NDEs can be explained by a sudden shift between different states of awareness, which he calls a "borderland" of consciousness. Movement between two of these states — wakefulness and REM sleep — is controlled by a switch deep in our brainstem. Nelson suggests that under certain crisis situations, like cardiac arrest, this switch malfunctions, causing a blending of REM and waking consciousness, also known as REM intrusion, as if the brain were stuck between gears. "The brain switch is deeply intertwined with [our] fight-or-flight reflexes," he says. In a study of 55 NDErs published in *Neurology*, Nelson and his colleagues suggest that under life-threatening circumstances, people who had experienced REM intrusion in the past were more likely to have an NDE.

Many of these NDE trademarks, such as the light that some describe during an episode, says Nelson, can be traced back to this hybrid state of consciousness. "REM [sleep] is characterized by the activation of visual systems," he says, "so I would expect someone to experience light." Similarly, OBEs are sometimes a byproduct of REM sleep, so it makes sense that they would be a feature of REM intrusion. Other hallmarks, says Nelson in a 2015 paper, like the sensation of bliss often termed "mystical feelings of oneness," can be explained by fading blood flow and oxygen as the brain fights to keep itself alive. Greyson has challenged several of these theories. The REM intrusion theory, he says, is refuted by NDEs that take place under certain conditions that inhibit REM sleep, such as with anesthesia. He also mentions studies that show NDErs have the same, or



Fischer co-authored 2016's *Near-Death Experiences: Understanding Visions of the Afterlife*.

even higher, oxygen levels as those who have never experienced near-death, addressing the notion that fading cerebral blood flow helps trigger the event. Greyson parsed through many of the supposed explanations in a 2013 paper. “We can go on and on with all of these hypotheses that have been proposed,” he says. “And it sounds plausible. But when you look at the data, it contradicts it.”

Parnia makes even bolder claims regarding his research — namely, that consciousness appears to continue when the brain is shut down completely. He suggests this is possible because thought is a “fundamentally different entity” from the synaptic activity we’ve detected in brain cells. “From a scientific perspective, there’s not a single piece of evidence that demonstrates how brain cells could generate thoughts,” he says. “We [don’t] have the tools yet to measure it. That’s something for future generations of scientists.”

For now, though, Nelson remains unconvinced. “The assertion that our consciousness is retained without brain function [has] no verifiable evidence,” he says. “I’m not saying that it doesn’t happen. But it’s a matter of faith, not science.”

#### NEAR-DEATH PROFITEERING

In the past decade, plenty of popular nonfiction on NDEs has blurred that boundary between faith and science — and made some decent cash in the process. In 2010, the book *Heaven Is for Real*, in which a 4-year-old boy tells his parents how he visited heaven after surviving emergency surgery, sold more than 11 million copies and became Amazon’s #17 bestselling book of all time. (The movie it inspired, made by Sony in 2014, grossed over \$100 million worldwide.) In 2012, Mary Neal’s *To Heaven and Back* chronicled the orthopedic surgeon’s NDE after a kayaking accident. It spent six weeks on the *New York Times* bestseller list.

Perhaps the most oft referenced of these works, at least among the scientific community, is *Proof of*

*Heaven*, written by neurosurgeon Eben Alexander. In the book, the doctor describes how he spent a week in a coma that he says was caused by a rare case of *E. coli* bacterial meningitis. It sold nearly 2 million copies; Alexander was featured on the cover of *Newsweek* and made an appearance on *Fox and Friends*. His credentials as a neurosurgeon were used to support his claims of an afterlife, with an endorsement in the book’s opening pages from former stockbroker and *Hello From Heaven!* author Bill Guggenheim that reads, “No one could find a more perfect candidate” to spread the word about NDEs.

It didn’t take long for others to poke holes in Alexander’s story. In a feature in *Esquire*, journalist Luke Dittrich questioned both the neurosurgeon’s qualifications and the accuracy of his experiences. For example, one of the pillars behind Alexander’s proof of visiting other realms

is that his memories couldn’t have been hallucinations, since the bacterial infection had “all-but-destroyed [his] brain,” a prerequisite for consciousness. But Alexander’s physician, Laura Potter, told Dittrich that he was conscious during the first days of his coma — which she says was medically-induced, not caused by meningitis — as he was tapered off anesthesia.

As a neurologist, Nelson says that he is disturbed by cases of misinformation like Alexander’s. “He clearly had delirium and mistook it for reality,” he says. Fischer, the philosopher, offers a similarly harsh critique. “[His book] is not a scientific treatment,” he says. “Further, I will go to a neurosurgeon if I need brain surgery. But a neurosurgeon is not really specially trained to tell me about metaphysics.”

For Fischer, these examples highlight the potential for nonscientific works about NDEs to capitalize on, and even exploit, our fear of death. “These reports are very vivid,” he says. “And we look at the positive evidence they offer for an afterlife and ignore the problems with the evidence.”

Researchers like Parnia, however, are continuing to harness rigorous research approaches in their work. In a follow-up study, AWARE II, Parnia and his

colleagues are looking at 20 hospitals across the U.S. and Europe, using modern tech like brain oximeters and EEGs to monitor brain functioning during and after cardiac arrest. Whatever these studies show, Parnia says that the empirical science should inform people’s philosophical and spiritual beliefs, not the other way around; as such, these events shouldn’t be treated as hallucinations. He even prefers to avoid

the term NDE, because of how it has been used and interpreted. “You have millions of people all over the world who are basically telling you the same thing,” he says. “That means you can use all kinds of research methods to understand what it’s like to experience certain things.”

Greyson echoes Parnia’s belief that NDEs are not hallucinations, pointing to the accuracy of out-of-body reports. But he also acknowledges that we can’t confirm that NDEs have truly brushed against the afterlife. “Those are just subjective experiences,” he adds. With the research tools available today, explaining those experiences, whatever scientists decide to call them, will likely remain an exercise in philosophy just as much as hard science. ■

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