



An analysis of the incidence of NDEs among critically ill patients as documented in nine prospective studies in four countries yielded an average estimate of 17%.

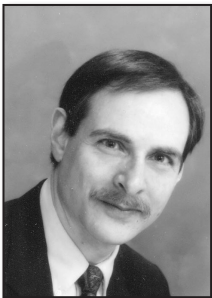
Near-death experiences (NDEs), profound experiences reported by some people who survive close brushes with death, are important to clinicians because they often lead to pervasive changes in attitudes and behavior; because they may be confused with psychopathological states; and because they may enhance our understanding of consciousness. Proposed psychological and physiological explanations lack empirical support and fail to explain NDEs, which pose a challenge to current models of the mind-brain relationship.

Introduction

When some people come close to death, they go through a profound experience that may include a sense of leaving the body and entering some other realm or dimension,

transcending the ordinary confines of time and space. Although these events had been identified as a discrete syndrome as early as 1892,¹ it was not until 1975 that Moody introduced the term *near-death experiences* (NDEs) for these phenomena. Moody described characteristic features commonly reported by survivors, including ineffability, overwhelming feelings of peace, seeing a tunnel, a sensation of being out of the body, meeting nonphysical beings including a “Being of Light,” reviewing one’s life, a border or point of no return, and coming back to life with marked changes in attitudes and with knowledge not acquired through normal perception.² A recent review of the accumulated findings from thirty years of research since Moody’s seminal work has essentially confirmed his original description.³

An analysis of the incidence



Bruce Greyson, MD is the Chester F. Carlson Professor of Psychiatry & Neurobehavioral Sciences and Director of the Division of Perceptual Studies at the University of Virginia School of Medicine.
Contact: cbg4d@virginia.edu

**One of the problems with NDE research,
is that almost all of it has been retrospective,
raising the question of reliability
of the experimenter's memories.**

of NDEs among critically ill patients as documented in nine prospective studies in four countries yielded an average estimate of 17%.³ With advancements in medical resuscitation techniques, the frequency of NDEs has increased, and thus about 9 million people in the United States alone have reported this kind of experience.⁴ In the last 30 years, the near-death phenomenon has been investigated extensively.⁵ Near-death experiences are important to physicians for three reasons. First, NDE precipitate pervasive and durable changes in beliefs, attitudes, and values.⁶ Second, they may be confused with psychopathological states, yet have profoundly different sequelae requiring different therapeutic approaches.⁷ Third, clarification of their mechanisms may enhance our understanding of consciousness and its relation to brain function.⁸

One of the problems with research into NDEs is that, with a few notable exceptions, almost all NDE research has been retrospective, raising the question of the reliability of the experimenter's memories. Autobiographical memories are subject to distortion over years, and memories of unusual or traumatic events may be particularly unreliable as a result of emotional influences. However, memories of NDEs are experienced as "more real" than memories of other events,⁹ and memories of NDEs have been shown to be unchanged over a period of 20 years.¹⁰

Explanatory Models

Studies of near-death experiencers have shown them collectively to be psychologically healthy individuals who do not differ from comparison groups

in age, gender, race, religion, religiosity, mental health, intelligence, neuroticism, extroversion, trait and state anxiety, or relevant Rorschach measures.¹¹

Expectancy

A plausible hypothesis postulates that near-death experiences are products of the imagination, constructed from one's personal and cultural expectations, to protect oneself from facing the threat of death. Comparisons of NDE accounts from different cultures suggest that prior beliefs have some influence on the kind of experience a person will report following a close brush with death.

However, individuals often report experiences that conflict with their specific religious and personal expectations of death; people who had no prior knowledge about NDEs describe the same kinds of experiences as do people who are quite familiar with the phenomenon, and the knowledge individuals had about NDEs previously does not seem to influence the details of their own experiences; experiences that were reported before 1975, when Moody's first book coined the term NDE and made it a well-known phenomenon, do not differ from those that were reported since that date;¹² and young children, who are less likely to have developed expectations about death, report NDEs with features similar to those of adults.

Cross-cultural differences in NDE accounts suggest that it is not the core experience that differs but the ways in which people interpret what they have experienced in terms of the images, concepts, and symbols available to them.¹³

Birth Memories

Some authors have suggested that NDEs, with their dark tunnel, bright light, and going to another realm, could represent memories of one's birth. However, newborns lack the visual acuity, spatial stability of their visual images, mental alertness, and cortical coding capacity to register memories of the birth experience, and reports of out-of-body experiences (OBEs) and passing through a tunnel to another realm are equally common among persons born by Caesarean section and those born by normal vaginal delivery.¹⁴

Altered Blood Gases

A common assumption has been that anoxia or hypoxia, as a common final pathway to brain death, must be implicated in NDEs. However, NDEs occur without anoxia or hypoxia, as in non-life-threatening illnesses and near-accidents, and hypoxia or anoxia generally produces idiosyncratic, frightening hallucinations, and leads to agitation and belligerence, quite unlike the peaceful NDE with consistent, universal features. Furthermore, studies of people near death have shown that those who have NDEs have oxygen levels the same as, or higher than, those who do not have NDEs.¹⁵ Likewise, some authors have suggested that hypercarbia may contribute to NDEs; but several studies have reported carbon dioxide levels to be normal or below normal during NDEs.¹⁵

REM Intrusion

NDEs have been associated with intrusion into waking consciousness of cognition typical of rapid eye movement (REM) sleep. However, the REM intrusion hypothesis is contradicted by the common occurrence of NDEs under conditions that inhibit REM, such as general anesthesia,¹⁴ and by the finding of reduced REM in near-death experiencers.¹⁶

Toxic or Metabolic Hallucinations

NDEs have been dismissed as elaborate hallucinations produced either by medications given to dying patients or by metabolic disturbances or brain malfunctions as a person approaches death. However, many NDEs are recounted by individuals who had no metabolic or organic malfunctions that might have caused hallucinations, and patients who receive

medications in fact report fewer NDEs than do patients who receive no medication.¹⁴

Furthermore, organic brain malfunctions generally produce clouded thinking, irritability, fear, belligerence, and idiosyncratic visions, quite unlike the exceptionally clear thinking, peacefulness, calmness, and predictable content that typify the NDE. Visions in patients with delirium are generally of living persons, whereas those of patients with a clear sensorium as they approached death are almost invariably of deceased persons. Patients who were febrile or anoxic when near death report fewer NDEs and less elaborate experiences than do patients who remain drug-free and are neither febrile nor anoxic. That is, drug- or metabolically-induced delirium, rather than causing NDEs, in fact inhibits them from occurring or being recalled.¹⁴

Neurochemistry

NDEs have been speculatively attributed to a number of neurotransmitters in the brain, most frequently endorphins or other endogenous opioids, a putative ketamine-like endogenous neuroprotective agent acting on N-methyl-D-aspartate (NMDA) receptors, serotonin, adrenaline, vasopressin, and glutamate. These speculations are based on hypothetical endogenous chemicals or effects that have not been shown to exist, and are not supported by any empirical data.¹⁷

Neuroanatomy

NDEs have also been speculatively linked to a number of anatomic locations in the brain, including the frontal lobe attention area, the parietal lobe orientation area, the thalamus, the hypothalamus, the amygdala, the hippocampus, Reissner's fiber in the central canal of the spinal cord, and most often the right temporal lobe, based on purported similarity of NDEs to temporal lobe seizure phenomena. However, NDE-like phenomena are almost never seen in temporal lobe seizures, and electrical stimulation of the temporal lobes typically elicits fragmented bits of music, isolated and repetitive scenes that seemed familiar, hearing voices, experiencing fear or other negative emotions, or seeing bizarre, dream-like imagery, in addition to a wide range of somatic sensations that are never reported in NDEs.¹⁷

These putative neurological mechanisms, for which there is little if any empirical evidence, may suggest brain pathways through which NDEs are expressed or interpreted, but do not necessarily imply causal mechanisms.¹⁷

The International Association for Near-Death Studies

The International Association for Near-Death Studies (IANDS) was founded in 1978 “to build global understanding of near-death and near-death-like experiences through research, education, and support.”

The organization was founded by physicians Michael Sabom, MD, Raymond Moody, MD, and Bruce Greyson, MD; psychologist Kenneth Ring; and medical sociologist John Audette. IANDS’ mission and main focus have remained constant over the years, as it has supported near-death experiencers, promoted education, and encouraged research.

IANDS has published a scholarly peer-reviewed journal, *The Journal of Near-Death Studies*, since 1981, as well as a quarterly newsletter, *Vital Signs*. IANDS also publishes *Near-Death Experiences: Index to the Periodical Literature, 1877 through 2011*, a periodically updated digital annotated bibliography, providing researchers and clinicians with an unprecedented resource on all periodical publications that have addressed NDEs.

The IANDS website, www.iands.org, includes information for researchers, experiencers, and clinicians, including downloadable brochures on topics such as aftereffects of NDEs, helping near-



INTERNATIONAL ASSOCIATION FOR
NEAR-DEATH STUDIES

death experiencers, children’s NDEs, distressing NDEs, NDEs in combat veterans, the impact of NDEs on bereavement, and psychotherapy for experiencers. IANDS has also hosted an annual conference for the past 30 years; the 2014 conference will be held in California in early September; see the IANDS website for the exact location and dates.

IANDS orchestrated and has made available in the U.S. the BBC production, “The Day I Died,” and sponsors a grant program through which the video has been included in the curricula of 12 U.S. medical schools. The organization also provides an online course on NDEs that offers continuing education credits through the University of North Texas for nurses, psychologists, social workers, chaplains, marital and family therapists, and professional counselors.

IANDS coordinates local educational and support groups, called Friends of IANDS, with chapters that meet periodically in 41 cities across the U.S. and 15 more in other countries. For information about the St. Louis Metropolitan Area chapter, which meets the first Sunday of every other month from 2:00 to 4:00 p.m. at The Living Insights Center, 6361 Clayton Road, Clayton, MO 63117, contact Linda Jacquin at jacadv@centurytel.net.

Effects of Near-Death Experiences

Positive Effects

Regardless of their cause, NDEs can permanently and dramatically alter the individual experiencer’s attitudes, beliefs, and values. The literature on the aftereffects of NDEs has focused on the beneficial personal transformations that often follow. A recent review of research into the characteristic changes following NDEs found the most commonly reported to be loss of fear of death; strengthened belief in life after death; feeling specially favored by God; a new sense of purpose or mission; heightened self-esteem; increased compassion and love for others; lessened concern for material gain, recognition, or status; greater desire to serve others; increased ability to express feelings; greater appreciation of, and zest for, life; increased focus on the

present; deeper religious faith or heightened spirituality; search for knowledge; and greater appreciation for nature.⁶ These aftereffects have been corroborated by interviews with near-death experiencers’ significant others and by long-term longitudinal studies.¹⁷

Negative Effects

Although NDErs sometimes feel distress if the NDE conflicts with their previously held beliefs and attitudes, the emphasis in the popular media on the positive benefits of NDEs inhibits those who are having problems from seeking help. Sometimes people who have had NDEs may doubt their sanity, yet they are often afraid of rejection or ridicule if they discuss this fear with friends or professionals. Sometimes NDErs do receive negative reactions from professionals when they describe their

experiences, which discourages them even further from seeking help in understanding the experience.¹⁸

Family and friends may find it difficult to understand the NDER's new beliefs and behavior, as many of their new attitudes and beliefs are so different from those around them. Difficulty reconciling the new attitudes and beliefs with the expectations of family and friends can interfere with maintaining old roles and lifestyle, which no longer have the same meaning. NDERs may find it impossible to communicate to others the meaning and impact of the NDE on their lives.¹⁸

Researchers have noted that the value incongruities between NDERs and their families lead to a relatively high divorce rate among NDERs. The effects of an NDE "may include long-term depression, broken relationships, disrupted career, feelings of severe alienation, an inability

to function in the world, long years of struggling with the keen sense of altered reality."¹⁹

Near-Death Experiences & Mental Health

Although retrospective studies of near-death experiencers have shown most of them to be psychologically healthy individuals, NDEs may be confused with several psychopathological conditions.

Depersonalization

NDE have been described as a type of depersonalization, or feeling of strangeness or unreality, that mimics a state of death and serves as a sacrifice of a part of the self to avoid actual death. However, depersonalization would not account for the hyperalertness, enhanced affect, and

The Division of Perceptual Studies

The Division of Perceptual Studies at the University of Virginia Health System is a research unit within the Department of Psychiatry and Neurobehavioral Sciences at the University of Virginia Health System.

It was founded 45 years ago under the leadership of the late Ian Stevenson, after an initial endowment from the



late Chester F. Carlson, inventor of xerography. The Division's main purpose, and the *raison d'être* for its foundation, is the scientific, empirical investigation of phenomena that challenge currently accepted models of the nature of mind and consciousness and their interactions with the physical world. Despite widespread accounts and popular interest in these phenomena, there is a paucity of careful scientific research into their occurrence and processes.

The Division's researchers are dedicated to the use of scientific methodologies in their investigation of a range of such phenomena that so far have defied adequate explanation. Examples of such phenomena include near-death experiences, out-of-body experiences, claimed memories of previous lives, apparitions, deathbed visions, accounts of apparent spontaneous paranormal phenomena, and

laboratory experiments on apparent paranormal phenomena.

The Division is the oldest university-based research unit in the world established specifically for the empirical study of the relationships of mind to brain. Although it is part of the University of Virginia, its research is not funded by state money but is supported entirely

by grants from outside foundations and institutions and from donations from private individuals.

The Division maintains the Ian Stevenson Memorial Library, a specialized library of scholarly books and journals, which is a resource affiliate of the Library of Congress and the National Library of Medicine; and the Ray Westphal Neuroimaging Laboratory, a state-of-the-art EEG facility with an electromagnetically and acoustically shielded experimental chamber. Although the Division has focused its resources on research rather than education, it does provide summer research fellowships for medical students and research electives for both medical students and psychiatric residents, and has hosted a post-doctoral fellowship.

The director of the Division is Bruce Greyson, MD. Current faculty researchers include Carlos Alvarado, PhD, Ross Dunseath, PhD, Edward Kelly, PhD, Emily Kelly, PhD, and Jim Tucker, MD.

Near death experiences have been described as a type of depersonalization or a feeling of strangeness or unreality that mimics a state of death and serves as a sacrifice of a part of the self to avoid actual death.

mystical consciousness typically seen in NDEs; and depersonalization differs from NDEs in its age and gender distribution, unpleasant and dreamlike quality, and separation of the observing self from the functioning self.⁷

Dissociation

NDEs have been compared with dissociation, the separation of thoughts, feelings, or experiences from the normal stream of consciousness and memory that is an adaptive response to trauma common in otherwise normal people. Many NDEs share with dissociation the disconnection of perception, cognition, emotion, and identity from the mainstream of the individual's conscious awareness. NDErs may have a tendency to dissociate in response to catastrophic events, though not in response to everyday stressors. Symptoms of dissociation among near-death experiencers, though higher than among non-experiencers, are still within the range of the normal population and far below that seen in clinical dissociative disorders. The dissociative symptom profile of NDErs is suggestive of a normal psychophysiological response to stress, rather than a pathological type of dissociation or a manifestation of dissociative disorder.⁷

Posttraumatic Stress Disorder

NDEs may lead to symptoms of posttraumatic stress disorder (PTSD) like recurrent, intrusive recollections of the event, recurrent distressing dreams of the event, diminished interest in previously important activities, estrangement from others, and a sense of foreshortened future. The incidence of PTSD symptoms among NDErs

is higher than that among survivors of close brushes with death without NDEs, although it is within the normal range and far below that seen in clinical PTSD. The NDErs' profile of moderate elevation of intrusive thoughts, images, feelings, and dreams, but no elevation of avoidant psychic numbing, behavioral inhibition, or counterphobic activities, is typical of a nonspecific response to catastrophic stress rather than of PTSD.⁷

Other Pathological Conditions

NDEs differ from autoscopy, seen in a variety of brain lesions, in that the observing self or point of perception in NDEs is experienced as outside the body, from which perspective the subject sees his or her own inactive physical body, rather than seeing an apparitional "double" (or more typically a portion of one) from the perspective of the physical body, as in autoscopy. NDEs are more complex than the mental imagery induced by drugs, and more often endowed with personal meaning, and often occur in the absence of psychoactive substances. NDEs can be differentiated from brief psychotic disorders by their acute onset following a stressful precipitant, and by the experiencers' good premorbid functioning and positive exploratory attitude toward the experience.⁷

NDEs in Psychiatric Patients

In a large sample of patients in a psychiatric outpatient clinic, among those patients who had come close to death, scores on every measure of psychological distress were lower for those who reported NDEs than for those who did not. The percent of patients in this study reporting near-death experiences was comparable

to that found in the general population, suggesting that mental illness itself is not associated with near-death experiences, but in fact NDEs may mitigate the distress of mental illness.²⁰

Near-Death Experiences & Consciousness

Some of the phenomenological features of NDEs are difficult to explain in terms of our current understanding of psychological or physiological processes. For example, experiencers sometimes report having viewed their bodies from a different point in space and are able to describe accurately what was going on around them while they were ostensibly unconscious;²¹ or that they perceived corroborated events occurring at a distance outside the range of their sense organs, including blind individuals who describe accurate visual perceptions during their NDEs.²²

Furthermore, some NDErs report having encountered deceased relatives and friends, and some child NDErs describe meeting persons whom they did not know at the time of the NDE but later identified as deceased relatives from family portraits they had never seen before. Other experiencers report having encountered recently deceased person of whose death they had no knowledge, making expectation a highly implausible explanation.²³ These aspects of NDEs present us with data that are difficult to explain by current physiological or psychological models or by cultural or religious expectations.²²

These features and the occurrence of heightened mental functioning when the brain is severely impaired, such as under general anesthesia and in cardiac arrest, challenge the common assumption in neuroscience that consciousness is solely the product of brain processes, or that mind is merely the subjective concomitant of neurological events.²⁴

References

1. Noyes R, Kletti R. The experience of dying from falls. *Omega* 1972;3:45-52.
2. Moody, RA. *Life After Life*. Covington, GA: Mockingbird Books; 1975.
3. Zingrone NL, Alvarado CS. Pleasurable Western adult near-death experiences: features, circumstances, and incidence. In: Holden JM, Greyson B, James D, editors. *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009:17-40.
4. van Lommel P. Near-death experiences: the experience of the self as real and not as an illusion. *Annals of the New York Academy of the Sciences* 2011;1234:19-28.
5. Holden JM, Greyson B, James D (editors). *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009.

6. Noyes R, Fenwick P, Holden JM, Christian SR. Aftereffects of pleasurable Western adult near-death experiences. In: Holden JM, Greyson B, James D, editors. *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009:41-62.
7. Greyson B. Near-death experiences: clinical implications. *Revista de Psiquiatria Clínica* 2007;34(suppl 1):49-57.
8. Parnia S, Fenwick, P. Near death experiences in cardiac arrest: visions of a dying brain or visions of a new science of consciousness? *Resuscitation* 2002;52:5-11.
9. Thonnard M, Charland-Verville V, Bredart S, Dehon H, Ledoux D, Laureys S, Vanhauzenhuysse A. Characteristics of near-death experiences memories as compared to real and imagined events memories. *PLoS ONE* 2013;8(3):e57620.
10. Greyson B. Consistency of near-death experience accounts over two decades: Are reports embellished over time? *Resuscitation* 2007;73:407-411.
11. Holden JM, Long J, MacLurg BJ. Characteristics of western near-death experiencers. In: Holden JM, Greyson B, James D, editors. *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009:109-133.
12. Athappilly GK, Greyson B, Stevenson I. Do prevailing societal models influence reports of near-death experiences? *Journal of Nervous & Mental Disease* 2006;194:218-222.
13. Kellehear A. Census of non-western near-death experiences to 2005. In: Holden JM, Greyson B, James D, editors. *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009:135-158.
14. Greyson B, Kelly EW, Kelly EF. Explanatory models for near-death experiences. In: Holden JM, Greyson B, James D, editors. *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009:213-234.
15. Greyson B. Near-death experiences. In: Cardeña E, Lynn SJ, Krippner S, editors. *Varieties of Anomalous Experience: Examining the Scientific Evidence*, 2nd edition. Washington: American Psychological Association 2013:333-367.
16. Britton WB, Bootzin RR. Near-death experiences and the temporal lobe. *Psychological Science* 2004;15:254-258.
17. Kelly EW, Greyson B, Kelly EF. Unusual experiences near death and related phenomena. In: Kelly EF, Kelly, EW, Crabtree A, Gauld A, Grosso M, Greyson B. *Irreducible Mind: Toward a Psychology for the 21st Century*. Lanham, MD: Rowman & Littlefield 2006:367-421.
18. Greyson B. The near-death experience as a focus of clinical attention. *Journal of Nervous & Mental Disease* 1997;185:327-334.
19. Bush NE. Is ten years a life review? *Journal of Near-Death Studies* 1991;10:5-9.
20. Greyson B. Near-death experiences in a psychiatric outpatient clinic population. *Psychiatric Services* 2003;54:1649-51.
21. Holden JM. Veridical perception in near-death experiences. In: Holden JM, Greyson B, James D, editors. *The Handbook of Near-Death Experiences: Thirty Years of Investigation*. Santa Barbara, CA: Praeger/ABC-CLIO 2009:185-211.
22. Greyson B. Implications of near-death experiences for a postmaterialist psychology. *Psychology of Religion and Spirituality* 2010;2:37-45.
23. Greyson B. Seeing dead people not known to have died. *Anthropology & Humanism* 2010;35:159-171.
24. Facco E, Agrillo C. Near-death experiences between science and prejudice. *Frontiers in Human Neuroscience* 2012;6:209. (doi: 10.3389/fnhum.2012.00209)

Disclosure

None reported.

