Near Death Experiences and Death-Related Visions in Children: Implications for the Clinician

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Introduction

Near death experiences (NDEs) have been reported throughout human history in a wide variety of cultures. In the past 20 years an explosion of accounts of such experiences occurring to those surviving coma, cardiac arrest, and noninjurious near fatal brushes with death has been reported. Such events occur to a broad cross section of society, including children, and are variously estimated to occur in between 10% and 90% of near death situations. A number of similar elements are common to NDEs, including out-of-body experiences (OBEs), hearing buzzing or rushing sounds, entering into a void or a tunnel, seeing or entering into a bright spiritual light, encountering a border or limit, and the subjective perception of making a conscious choice or being forced to return to the body. Anecdotal cases exist in which the reality of the out-of-body perceptions can be independently verified by external conditions, situations, people, and objects. Childhood experiences are often compelling because children have a different perception of death than adults. Their experiences are simple and reveal a core NDE that is universal to the human dying experience.

The various elements of the experience can be replicated by electrical stimulation studies of the temporal lobe or by hallucinogenic drugs. It is possible that hallucinogenic neurotransmitters play a role in the NDE. Wish fulfillment, death denial, dissociative psychologic trauma, and other psychologic defense mechanisms have been advanced to explain the experiences. Regardless of cause, the experiences are apparently transformative, resulting in decreased death anxiety, heightened spiritual perceptions and awareness, increased subjectively perceived psychic abilities, and decreased symptoms of depression and anxiety. Adults who had NDEs as children describe themselves as living mentally and physically healthy lives, even donating more money to charity than control populations.

Many commentators agree that NDEs provide invaluable insight into the processes of dying. Their importance lies in documenting that dying patients are often aware of their surroundings and undergoing spiritual and emotionally dynamic experiences, even if patients appear to be unconscious. These experiences theoretically can be invaluable in empowering dying patients and their families to understand death and heal grief. If society can institutionalize the concept that the processes of dying are often joyous and spiritual, irrational use of medical technology in dying patients may be reduced, leading to substantial savings in health care costs. The current debate over whether they document an objectively real heaven or soul obscures the fact that NDEs are as real as any other human emotion and ability. Although enough evidence currently exists to make the survival hypothesis scientifically respectable, near death studies

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are in their infancy and are not currently of sufficient caliber to support such a conclusion. These experiences are the only objective evidence of what it is like to die. Near death experiences are best understood as one element of a spectrum of related clinical experiences known as death-related visions.

For the past 100 years, there has been intense interest in the scientific community and by the general public in scientific verification and validation of spiritual experiences.[1] At the end of the nineteenth century, scientists in England and America investigated encounters with ghosts, mediums, spirit communication with the dead, and death-bed and near death visions. Although interest in the scientific community waned from 1910 to 1960, once again interest in deathbed and NDEs has exploded. This is not an isolated phenomenon but has appeared in the context of tremendous public interest in a wide variety of spiritual and paranormal issues, including spirit channeling, paranormal abilities, spiritual healing, encounters with UFOs, and even kidnappings by UFOs.[2-5] It has been pointed out that the first wave of UFO sightings occurred in the late nineteenth century at the same time of the first modern accounts of deathbed visions.[5] Carl Sagan[6] is the most articulate proponent of the idea that perhaps these visions and encounters originate in our own cultural psychology and are not so much an understanding of another world but a reflection of our own inner psychic longings.

Interest in these experiences has become most pronounced during a time in which our society is losing its cultural myths and shared spiritual rituals and longings. Joseph Campbell stated that the image of death is the beginning of mythology. Mythology makes one "part of a society of living and dead that came long before you were here and will be here long after you are gone. It nourishes you and protects you."[7] Mankind's myths give meaning to individual lives and help to interpret events such as death.

It is precisely this current lack of meaning for our own death and the death of others that, in my opinion, has led to such intense interest in NDEs, especially the experiences of children, who are often regarded as too naive to invent stories based on repressed fear of death. Historian Philip Aries[8] describes modern society as having abandoned the traditional relationship between death and society, which had previously existed for tens of thousands of years. Starting with modern funeral practices in which the body was embalmed and preserved, death has become taboo, medicalized, and a defeat for patient and physician alike. Bluebond-Langer,[9] an anthropologist who studied children on a cancer ward for 1 year, described a sense of mutual pretense and shared denial in children who were dying of cancer between the children, parents, staff, and physicians. Once a fatal diagnosis was made, conversations with the child became briefer and often terminated abruptly if the child asked too many questions about death. A child's death is seen as a defeat by everyone involved.

Pediatricians have been described as not being trained to handle children's deaths. Residency training often provides a model that death occurs because either we have failed or our medical systems have failed. Colleagues often do not support each other when a patient dies, and it is difficult to create a climate in which death can be openly discussed and grief expressed.[10]

If it is difficult for us to confront death, it is understandable that it is equally difficult to discuss spiritual visions associated with near death. Spiritual visions are often stigmatized as being irrational and absurd within the scientific community.[11] Our world view is so closed to anything nonmaterial that scholarship and a belief in the spiritual are perhaps mutually exclusive. In describing a case of spontaneous cure of a patient who was moribund with meningococcal meningitis and Waterhouse-Friderichsen syndrome, Gardner[12] reports that the patient ascribed her recovery to spiritual intervention. The physicians involved described her as "the one that got away," meaning that she simply defied the odds of dying for unknown reasons. Although her case was well documented, soon the accuracy of the diagnosis was called in doubt. He concludes that so fixed is our world view that even in such well-documented cases where patients and physicians are available for questioning, spiritual cures are probably impossible to prove. This case dramatically illustrates the wide gap between the world view of physicians adhering to our current scientific medical model and the more spiritual world view often seen in our patients.

Technology has so dominated modern medicine that a recent editorial in the *New England Journal of Medicine* advocated rehabilitating auscultation of the heart with a stethoscope because it might lead to the physician actually touching and talking to the patient. "This therapeutic aspect of the diagnostic procedure is thwarted if, instead of meeting the doctor, the patient is given a sheaf of requisitions for expensive laboratory tests that may or may not be germane to his or her condition."[13]

Clearly, much of the success of modern medicine is because of those very technological advances that allow so many to have NDEs. Yet every experienced physician acknowledges that there is a faith or a spirit or a vague undefined something that motivates the human body sometimes to heal and other times to

die. Extensive reviews of the interactions of the mind and body to heal have been published. Prayer, guided imagery, cancer support groups, and simply having patients talk with an anesthesiologist about what the pain of surgery will be like all have documented effects on biologic healing. One recurrent theme in the mechanisms of the mind's effect on the body is that there is a belief system that has meaning for the patient.[14-17] One of the main effects of NDEs is that they create new meanings of life and death for those who have them, as well as those who hear about them, new meanings that may well be therapeutic.[18]

There is nothing inherently unscientific or irrational about studying the process of dying by talking to children and adults who have survived near death. Every scientific investigation begins with a surprising fact, something that challenges our preconceived notion of what the world should be.[19] Nevertheless, studying the subjective accounts of survivors of profound emotional and physical trauma is obviously fraught with research pitfalls. Issues of recall bias, patient selection bias, investigator bias, cultural expectations, and the fact that most of the research in this field is not peer reviewed and often the subject of television talk shows rather than skeptical scientific debate makes study design and interpretation of data difficult. However, in the past decade, the field of qualitative research has matured and become a science.[20-24] As clinicians, we routinely make decisions based on clinical research. Certainly interpreting near death research is no more difficult than interpreting research on other equally mysterious topics such as colic and infant feeding practices.

Spiritual visions and paranormal events can be best studied if perceived as psychic events described by human beings, with an agnostic viewpoint to the veridical reality of them. Eleven percent to 14% of the average American population who are mentally and physically healthy and do not take drugs have had an OBE[25]; such experiences must be normal and worthy of study as a unique clinical entity.

This article will review NDEs from the perspective of a practicing pediatrician. I will discuss their implications in bereavement counseling of parents who have had children die, as well as in working with dying children. These experiences raise a wide variety of difficult emotional issues in the children who have them and in their parents. Medical professionals and society can benefit from learning about such experiences, but the lack of a common cultural understanding of such experiences, as well as the wide gap between the materialistic viewpoint of the scientific establishment and the spiritual longings of the general public, must be resolved before we can begin to use these experiences to best advantage.

Historical Perspective

The process of dying or surviving near death has been associated throughout history with spiritual visions that are strikingly similar to modern NDEs. *The Egyptian Book of the Dead*[26] (1500 BC) is a manual to provide magical means by which the dead soul can join the crew of a ship, pass through the dark valley of the underworld, and be united with the Sun God for eternity. The Aztec God Hero Quetzalcoatl in his death poem describes "the darkness twist in him like a river," which led to his seeing his own face as if in a cracked mirror, seeing a shining city, meeting people and religious figures, and ends "with his body changed to light, a star that burns forever in that sky."[27] Primitive shamans often underwent initiatory experiences that involved either actual or the perception of near death, spirit helpers, a journey to another reality that often was through a tunnel or a dark void, and a return to ordinary consciousness with new knowledge and understanding.[28]

Anthropologist Chris Carr[29] compared the contemporary NDEs of Americans of European descent with the death experiences as understood by Tibetan Buddhist llamas of the eighth through eleventh centuries AD. He found that the most clearly culturally shared events included hearing loud noises like a wind or a roar early in the death process; seeing religious figures; seeing a white or gold light that is separate from oneself defining a dualistic consciousness; merging with that light to create a sense of oneness; a life review or judgment; and more generally, events that reveal death to be a learning process. He concludes that death, at least for EuroAmericans and Tibetans, is much like life in its essential purposes and meanings and that dying is a reality for learning, based on choice, and offering opportunity for growth.

In contrast, a review of a wide variety of shamanistic practices, otherworld beliefs, and primitive mythologies shows that there are many different types of symbols and images associated with dying. Although I am not aware of any formal review, my own analysis of this literature indicates that perhaps only 10% to 20% of such images are similar to NDEs.[30-34]

One example of this is the ancient Babylonian story of Gilgamesh, which has been described as having in it an NDE, in which the hero crawled through a dark tunnel, entered into a wonderful garden that was the afterlife filled with a wonderful light. He wanted to stay, but the sun god sent him back through the tunnel into this life.[35] However, another

translation of the same story emphasizes that the story itself is difficult to understand because it is in many versions and fragments. Gardner's version of the same events is filled with so many other details and images that it is hard to find similarities with modern NDEs.[36]

Although a belief in reincarnation is common to many peoples, many major religious traditions or philosophies such as Judaism, Buddhism, Confucianism, and Zen Buddhism do not particularly stress an afterlife or the survival of human consciousness after death.[37] Siegel[38] argues convincingly that primitive human behaviors surrounding death are simply the evolution and shaping of instinctive animal behaviors and have nothing to do with a belief in a soul or life after death.

Cavendish[39] credits the belief in an afterlife and the spiritual light seen in NDEs to primitive peoples' observance of the cycles of nature in which the spring brings the rebirth of the sun after the dark of winter.

It is too simplistic to understand the primitive origins of the NDE as representing some core spiritual experience common to all human cultures. It is fairer to state that many aspects of modern NDEs have been reported throughout all of human history. Such experiences are frequently embedded in core religious beliefs and have been described as simply being a subset of religious visionary experiences.[40]

Early Anecdotal Case Reports and Collections

Plato's *Republic*[41] describes an ordinary soldier named Ehr who nearly died on the battlefield but revives before being cremated. He described a journey from dark to light in the company of spirit guides, a moment of judgment, feelings of peace, and visions of unbelievable happiness. Sixth century Pope Gregory the Great collected examples of NDEs in his book of wonder tales called *Dialogues*. Similar to modern investigators, he made an effort to ensure that the subjects were of good character and not mentally ill. One example is a soldier who nearly died in battle, had an OBE, crossed a bridge over a dark gloomy river, and entered into a beautiful garden with a house of golden bricks.[40]

Chinese and Japanese Buddhists collected NDEs and their equivalent experiences artificially induced through meditative techniques in the seventh century AD. Their debates over the true nature of the experience are reportedly similar to our current twentieth century dialogue.[42]

In the eighteenth century, Swedish mining engineer and scientist Emanuel Swendenborg[43] collected and popularized numerous tales of NDEs and devoted the last portion of his life to a study of mysticism. An article in *Lancet* from 1866 describes how an archbishop was mistakenly pronounced dead, yet heard and observed conversations around him.[44] Numerous examples of NDEs exist in literature in the past 300 years.[45] The Mormon church has an enormous number of anecdotes of NDEs that have been collected from the early 1800s to the present.[46]

Swiss geologist and climber Albert Heim,[47] in the late 1800s, collected 30 firsthand accounts of fellow climbers who fell from great heights and survived. He stated that no grief was felt nor was there any fright, no trace of despair but rather a calm seriousness, a profound acceptance, and a dominant mental quickness. Time became greatly expanded. There was often a life review and visions of a transcendent heaven. Consciousness was painlessly extinguished at the point of impact, which was occasionally heard but not felt.

The modern concept of an NDE as triggered by death or after resuscitation was well established by the 1950s. Numerous prominent cases were reported including those of Admiral Francis Beaufort, writer Ernest Hemingway, Catholic priest Louis Tucker, explorer Richard Byrd, flying ace Edward Rickenbacher, psychologist Carl Jung, and many others.[45] German psychiatrist Oskar Pfister[48] reviewed the literature and presented a few cases of his own and concluded the subjects were having reactive fantasies to the fear of impending death. Anthropologist Irving Hallowell[49] reported that the Saulteaux Indians had a belief that dying involved a vivid out-of-body sensation, meeting dead relatives and spirit guides, and was a pleasant transition to another life. He believed that this belief came from direct experiences of aboriginal Indians who had nearly died and were revived, as well as from dreams and religious experiences in a conjuring lodge. French psychiatrists in the 1930s frequently discussed psychologic mechanisms for the OBE, some of which sound like NDEs.[50, 51] Geologist Robert Crookdall[52] collected a large number of NDEs in the 1950s, and he found virtually the same cluster of core elements and experiences as later described by Moody.

Modern Case Reports and Anecdotal Collections

The first systematic study of critically ill patients was by Russian physician Vladimir Negovsky, who routinely asked World War II soldiers who were "reanimated" from nearly dying of injuries and hypothermia what they remembered about the experience. He described "the great majority" as perceiving the experience as a deep sleep without dreams, although he acknowledges that some had memories of events

around them and occasionally described blissful scenes of an afterlife. He believed these were distortions of perception in a malfunctioning brain.[53, 54]

Druss and Kornfield[55] presented 10 survivors of cardiac arrest, three of whom had transcendent experiences of heaven. Dobson[56] reported only 1 of 20 cardiac arrest survivors who reported a transcendent or paranormal experience. Kalish[57] describes 15% of 600 subjects as having "faced inevitable death." He does not comment on any transcendent experiences in these subjects, even though they were interviewed about their feelings concerning death and near death. He further reported 323 subjects whom college students interviewed about near death. Despite "a high probability of fictional interviews," no transcendent or paranormal feelings were reported, although he did report that only 23% reported fear or panic, and many described life reviews, thinking of God, and praying.[58]

In a watershed article, Burch, Depasquale, and Philips[59] report a series of survivors of cardiac arrest who simply reported "a pleasant feeling as though they were entering a peaceful sleep." They were the first to recognize that interviewing survivors of cardiac arrest would perhaps give insights into the first 3 or 4 minutes of the dying process, which is the longest period of recall of psychic processes that might be expected. "As crude as the tool utilized in this study seems to be, there is no better model presently available to study the natural process of death." They informally and retrospectively interviewed 20 to 30 patients. When interviewed 25 years later, Dr. Phillips indicated that he did not remember any patients describing transcendent experiences and that he was not biased against receiving such information (personal communication with Dr. John Phillips, November 28, 1993).

Noyes[60] presented 215 accounts from 205 subjects who were in life-threatening situations but did not lose consciousness. The subjects were obtained "through a variety of informal contacts" and 76 were interviewed. His subjects described time slowing down, a calm emotionless state, rapid and vivid thoughts, déjà vu experiences, "detachment from the body," and then as circumstances became overwhelming or rescue efforts given up, revival of memories (panoramic memories) and effects typical of mystical consciousness seen in 10% to 15% of patients.

By 1972 the term "Lazarus complex" was coined for such experiences.[61] Canadian cardiologists presented a cardiac arrest survivor who had a complex OBE and NDE "similar to the concept of the soul leaving the body found in many religions."[62] Psychoanalyst Hunter[63] presents a case of a "hysterical woman" who had an NDE including childhood memories and a vision of the Taj Mahal, which he places within a psychoanalytic understanding of her personality.

In 1975 the flood of modern reports of NDEs began with the publication of *Life After Life* by psychiatrist and philosopher Raymond Moody.[64] He examined "a large number of accounts," perhaps as many as 150, from which he selected 50 to interview in depth. He readily acknowledges asking loaded questions and was very sympathetic to such experiences representing proof of life after death. He believed that he had to validate the patients' feelings and gain their trust, which of course makes objective research difficult. He described 15 distinct elements that are commonly associated with NDEs, as a sequence of events from hearing the news of death, to floating out of the body, feeling peaceful, meeting others, the being of light, the life review, the border, coming back, telling others, and the transformation. This was intended to be a composition of the ideal case, but many patients only had fragments and pieces of the experience.

After Moody's publication, issues of cultural contamination and examiner bias became extremely difficult to control. Moody's book had a deep emotional impact on the major researchers, including Bruce Greyson, Michael Sabom, and others. Greyson is quoted as saying "a whole new world opened up" after reading the book, even though it is based on subjects who often approached Dr. Moody after lectures, no systematic interview format was involved, and no review of medical records or psychiatric or medical history was done. By 1978 Moody, Audette, Ring, Greyson, and Sabom formed the International Association of Near Death Studies (IANDS), with George Gallup, Jr., as an advisor.

The organization plays an important role in counseling people who had NDEs and were in spiritual crisis. Similar to the rash of accounts of alien abductions today, with therapists and support groups grappling with the challenge of how to treat such patients, in the late 1970s and early 1980s there were dramatic accounts of people who had repressed their NDEs for years for fear of public ridicule. Best-selling books and appearances on talk shows dominated near death studies.[40] Ring[65] has documented that both groups of people share similar personality traits and may have been the victims of sexual or physical abuse as children, speculating that they may be more spiritually evolved and open to other realities as a result of that abuse.

The organization itself developed a spiritual and political agenda, commonly referred to as "New Age." Persons who had NDEs were considered advances in mankind's spiritual evolution.[66] Humanis-

tic psychologist Grey did a "cross-cultural study" of English NDEs and found they were similar to ones reported by her fellow IANDS researchers, supporting her conclusion that such experiences will help us to "live harmoniously with ourselves, with each other, and the planet that sustains us."[67] The organization's therapeutic role made independent objective research difficult. The organization has dominated most near death research since 1977, and most of the studies are published in its journal, which is not refereed or indexed in the medical or scientific literature.

This led to a research climate that is difficult to independently review or summarize. Ring[68] presented a study of 102 patients obtained partially from unselected hospitalized patients, and the rest from psychiatrist friends and newspaper advertisements. His interview format is filled with leading questions. The nature of the questions was heavily weighted toward answers that would please the interviewer by disclosing mystical events and personality transformations. The book is filled with impressive statistics based on a biased subject sample and poor data collection techniques.

Zalesky[40] has previously pointed out that even given this study design, when his results conflicted with Moody's work, he altered his conclusion so as to make both models fit the available data.

Vicchio[69] has commented on the discrepancy between the incidence of NDEs reported by IANDS researchers and their predecessors. Greyson[70] speculates that perhaps "skeptical interviewers may have subtly communicated to the patients the wisdom of keeping silent about any puzzling experiences they may remember," although acknowledging that perhaps the IANDS researchers were overenthusiastic. His own research presented data from 78 reports collected from letters from people who had read about NDEs in magazines that specialize in paranormal reports or other self-selected sources, and he then subjected that data to a battery of statistical tests.[71]

Scientific Studies

Atlanta cardiologist Michael Sabom describes a prospective case control study in adults. Although only a brief experimental design is described in his article in the medical journals, in his popular book he states that as a result of his contact with them on hospital rounds, his assistant interviewed 78 patients over 28 months whom he prospectively identified as being near death. He was careful not to tell his assistant any other details so she would not be biased. He also studied 38 "self referred" patients. Forty-three percent of the former group recalled an NDE consisting primarily of pleasant transcendent experiences. Patients who had NDEs differed from those who did not in that they had significantly longer periods of unconsciousness and longer and more complex resuscitations. Patients reported vivid OBEs, as well as mystical and transcendent experiences of another reality. His study indicated that the OBE of his subjects involved their viewing their own bodies, as opposed to an astral projection type of OBE where the body could travel at will.[72, 73]

Denver cardiologist Fred Schoonmaker[74] studied 2300 cases of cardiac arrest and described 1400 of them having NDEs similar to those described by Moody. Tennessee cardiologist Maurice Rawlings reported hundreds of NDEs in sequential patients he immediately interviewed after resuscitation. Many had visions of hell that they subconsciously suppressed and forgot about when interviewed weeks later. He states 18% of NDEs involve hellish visions. Rawlings converted to Christianity and described his findings in two popular books.[75, 76]

In contrast, Schnaper,[77] at the Maryland Shock Trauma Center, described NDEs as simply being a variant of intensive care unit psychosis, with recall bias and amnesia of unpleasant sensations and feelings. He interviewed 68 patients and found that 17 recalled events subjectively placed at the time of coma, and 8 initially claimed amnesia about later recalled events. His interview format was open ended, asking questions such as "what do you recall about being unconscious?" Recurrent themes included being held prisoner, having done something wrong to deserve imprisonment, and transcendent feelings about death. Schnaper presented a video demonstrating a woman who, while semiconscious during her ordeal in the intensive care unit, described a wide variety of paranoid feelings, illusions, delusions, and spiritual feelings. When interviewed several weeks later, she reported a more typical transcendent NDE. (Schnaper presented a video at the First Annual International Conference on Near Death Studies, Georgetown, Washington, DC, 1990.) Tosch[78] replicated Schnaper's study design and used an expert panel of clinical nurse specialists and physicians to develop the research tool. Fifteen posttraumatic coma patients reported a similar variety of experiences as in Schnaper's article, including a sense of being imprisoned, paranoid illusions and delusions, smelling a dead person, and hearing a bomb threat. Some patients had transcendent feelings of floating out of the body and having discussions with dead relatives. Tosch acknowledges that she approached the problem from a freudian theoretical framework; such a framework does not permit the possibility of the independent existence of a soul and views death-related visions as reactive fantasies.[79]

Numerous other case reports and studies are reported. Oakes[80] prospectively interviewed 21 survivors of cardiac arrest over a 2-year period and reported sensory awareness yet an inability to communicate, OBEs of the autoscopic variety, a journey through a tunnel toward a light, and feelings of indescribable splendor. I reported the first pediatric NDE, a 7-year-old girl who was without spontaneous heartbeat for 19 minutes and had fixed and dilated pupils. She recovered to give a detailed description of her own resuscitation including hearing pieces of conversations in the emergency room, accurately describing her own resuscitation with details such as nasal intubation and being placed in a CT scanner. This was followed by a spiritual journey with a spirit guide through a dark tunnel to a heavenly realm and a decision to return to consciousness.[81] Two miners trapped for 2 weeks underground, with adequate supplies and oxygen, described a wide variety of experiences including conversations with dead relatives, seeing spiritual beings and heavenly realms, and seeing doors open in the wall that seemed to lead to a heaven. Both men reported seeing and hearing a third miner who assured them they would be rescued.[82]

Psychiatrists Owen and Roberts,[83] in their thorough review of the topic in 1988, could only conclude: The NDE may best be regarded as a complex hallucinatory phenomenon occurring in persons who perceive themselves to be facing imminent death and is associated with the psychology of dying. Kastenbaum,[84] in his unfavorable review of my own speculative best-selling book, states that near death studies have betrayed their early promise and remain at the level of campfire stories.

NDEs are in fact stories told by patients who have nearly died. There is remarkable consistency in the stories themselves, whether reported by freudian psychiatrists, New Age psychologists, materialistic death-fearing cardiologists, nurses, anthropologists, pediatricians, geologists, mining engineers, even sneering radiologists, who published a case report under the headline "A Nowhere Near Death Experience. Heavenly Choir Interrupts Myelography."[85] Again and again, they are described as involving a sense of detaching from the physical body, looking at one's own body and surroundings from a vantage point outside the body, entering a void or darkness, and encountering a spiritual light. There is often a decision of some sort to return to the body.

The true incidence of such experiences and a precise phenomenology will have to wait for large-scale prospective studies. Enough evidence exists now that these experiences are intermingled with the psychology of dying and should not be considered hallucinations or pathologic processes.

NDEs involve a vividly real experience that is superimposed over ordinary reality. They are described as occurring in persons with intact egos and normal mental status examinations. They are most similar to religious visions and demonstrate few of the aspects of pathologic hallucinations.[86]

There is little evidence or reason to believe that these experiences represent psychiatric pathology or dysfunction, according to German psychiatrist Michael Schroeter.[35] They can be easily distinguished from hallucinations of schizophrenia or organic brain dysfunction.[87, 88] NDEs are predominantly positive and lack the paranoid ideation, distortions of reality, negative imagery, olfactory elements, and aggressive and hostile elements of drug-induced hallucinations or other transient psychoses.[89, 90] They represent an acknowledgment of reality, whereas intensive care unit psychosis usually represents a denial of reality.[91] They occur to people in excellent mental health,[18] who have a similar capacity for fantasy, as well as similar repressed anxieties as the typical population.[92] To explain NDEs as depersonalization or regression into the psychologic state before ego differentiation ignores the clinical experiences of the subjects, which are experienced with intact ego identity.

Furthermore, NDEs are described as occurring to infants and young children who have a different concept of death and have not yet experienced ego differentiation. Pediatric nephrologists from Massachusetts General present two childhood NDEs. One suffered a cardiac arrest from renal failure at 8 months of age and began to articulate her NDE at age 3. The experience involved going into a tunnel and seeing a bright light.[93] Although a precise understanding of the developmental aspects of death anxiety does not exist, most authorities agree that the child under age 2 has no concept of death and that from 2 to 5 years of age, there is a limited understanding that death is perhaps the temporary cessation of activity. The anxiety that children have at this age is comparable to separation anxiety and does not come from some deep-seated fear of death.[94]

Gabbard and Twemlow also present two cases of childhood NDEs. Todd was age 2 years 5 months when he bit into an electric cord from a vacuum cleaner. Medical records document that he was in ventricular asystole with no spontaneous respirations for approximately 25 minutes. After his resuscitation, he slowly recovered cortical and neurologic functions over the next 4 to 6 months. At age 33 months, he was playing in the living room when his mother asked him about biting into the cord. He stated: "I went into a room with a very nice man and sat with

him. (The room) had a big bright light in the ceiling. The man asked if I wanted to stay or come back with you." He then looked up at his mother and stated: "I wanted to be back with you and come home." He then smiled and went back to playing with his toys. This occurred in 1972, before the publication of Moody's book.

Mike was age 4 when he nearly drowned in a community swimming pool. He fell in the pool and was unable to swim and sank to the bottom. His mother rescued him and he did not require resuscitation. After being pulled out of the pool, he stated that he saw pretty lights on the end of a long bridge. He talked of golden lights and said that he learned how to swim. He had recently been to Disneyland and described the bridge as being similar to Cinderella's Castle. He wanted to return to the pool, stating that there was an old-time cabin down at the bottom of the pool with a cranky old man in the middle of the golden lights.

The psychoanalysts present a third case of a 29-year-old woman who was watching Elizabeth Kübler Ross on television describing the tunnel experience associated with NDEs. She suddenly remembered with vivid clarity that such a thing had happened to her when she was near death from a complicated case of the mumps. The experience was intensely vivid and similar to prior reports of NDEs, including drifting out of her bed, watching her mother place a cloth on her forehead, entering into the blackness of a dark tunnel, and traveling toward an intense bright light. A bearded man in a white robe appeared. She met others in heaven and finally returned to her body.[25]

Other pediatric cases are reported by William Serdahely[95] at the University of Montana. He surveyed pediatricians throughout Montana and surrounding states and asked if they had encountered pediatric NDEs in their practices. He collected four experiences. Pat was interviewed at age 9 concerning his near drowning at age 7. Medical records documented that he lost spontaneous heartbeat and respirations, and cardiac resuscitation was required after he fell off a bridge into the water while fishing. He stated he floated out of his body and "was up in the clouds. I was a little bit scared. I looked down and saw my body on a stretcher and Jim Perkins (a medic) with his head in his hands. Then I went into this tunnel. I wanted to go, but Abbie and Andy licked me and nagged me to go back." Abbie and Andy were his former dog and cat who had died. He further stated that time did not exist while in the tunnel. An amateur photographer present at the scene of the rescue photographed a picture of the medic, Jim Perkins, sitting with his head in his hands. Reportedly, Pat had not seen or heard of the picture before his description of his NDE.

A 10-year-old girl had a full cardiopulmonary arrest while in the intensive care unit after spinal surgery. She described her experience 2 years later, stating she was "peaceful and relaxed, and remembered seeing a whitest blue light at the end of a tunnel. She saw the shadow of a dog, and also a white lamb that was loving and gentle, which led her back to her body." Her parents reported that at age 2, she had a lamb that doubled as a music box that was her favorite stuffed animal.

Natalie was 17 when she suffered a respiratory arrest and seizures as the result of status asthmaticus. She found herself suddenly in a tunnel, "thinking logically that I was in a tunnel while I was having an asthma attack. Suddenly two light figures (her words) came to her. They were friendly, and took her hands and together they floated towards the light. As she was traveling, images came to her, of her father swinging her and she saw how sad her mother would be if she died. The beings set her down and she walked out of the tunnel and back to her body."

Mike, at age 4, fell from a high dive and landed on his head. His mother found him and believed him to be dead. He stated he was floating out of his body and was then in a fog. A shaft of yellow light, like the sun, penetrated the fog and surrounded him. At first the OBE was scary, but then he said he was with friends. He heard a warm comforting male voice asking him if he wanted to live or die, and he thought his mother would miss him, so he wanted to live and returned to consciousness.

These stories are best analyzed scientifically as "subjective paranormal experiences," a term developed by Vernon Neppe, director of neuropsychiatry at the University of Washington, to allow for clinicians to study visionary or paranormal experiences without taking a philosophical position as to the objective reality of them.[96] They intuitively have tremendous implications for counseling dying children and their parents, as well as bereavement counseling. As one 10-year-old boy I will present told me "you have to tell all the old people about this" (that he thought he was still alive after nearly drowning). Another girl in my practice, who nearly died of fulminant bacterial meningitis and had an NDE, has on her own, at age 10, decided to counsel children who are dying of leukemia and regularly visits several dying children. So the fact that these are stories that are extremely difficult to properly study should not blind us to the possibility that they represent a spiritual aspect of dying that is of potential use in grief counseling and working with dying patients.

Some of the confusion in the previously cited literature is because there are three distinct clinical entities (discussed below) that have not been previously demarcated.

Transient Depersonalization

Transient depersonalization is a transient dissociative event that occurs to subjects before accidental death. This "transient depersonalization syndrome" involves unusual clarity of thought, time seeming to slow down, and a sense of peace and calm. Anyone involved in a car accident has had this very commonplace reaction, which probably has tremendous survival advantage. Athletes describe a similar reaction when intensely concentrating; baseball hitters claim to at times see the ball well, time slows down, there is a sense of peace and clarity, they can't hear the crowd, but they can see the seams of the ball as it slowly rotates toward them. They often have a sense of detachment from the physical body.[97] Professional football player, Eugene Robinson, during a postgame interview, described making a game winning interception as "I didn't think about it. I couldn't hear or see anything. Time seemed to stand still. I watched my own body reach out and grab the football."

Noyes and Kletti,[98] in their many articles, consistently state that their subjects, who were not unconscious, did not have transcendental or the more typical NDE until rescue efforts or the accidental situation seemed irreversible.[99, 100] They assume that they are dealing with a clinical entity that is a spectrum of events from peaceful hyperalertness to the NDE. My interpretation of their data is that there are two distinct clinical entities, both of which are likely to be present in the context of near fatal car accidents.

Intensive Care Unit Psychosis

My understanding of Schnaper and Tosch's data is that they were in fact describing cases of intensive care unit psychosis with a few patients with true NDEs mixed in. It is not surprising that semiconscious patients denying reality and suffering from distortions and illusions of reality will describe spiritual elements and interpretations to their illusions and suffer from selective amnesia and recall bias in reporting their experiences. This does not mean that they are having NDEs, and the authors make no effort to document that the patients in fact perceived themselves as being near death. The clinical setting of NDEs is typically either fully conscious patients approaching accidental death or survivors of profound comas as a result of life-threatening illnesses or accidents. Tosch, for example, differentiates her patients with typical features of transient psychosis from those who spoke with dead relatives or had out-of-body perceptions but then arbitrarily presents that as being the same clinical entity and presumably the same cause without comment or explanation. Another case in the literature of a semiconscious delirious man who overdosed on narcotics and had hallucinatory ravings minutes after receiving naloxone is similarly misidentified as being an NDE.[100]

NDEs

These are best defined as a sequence of events beginning with the subjective perception of near death, the subjective sensation of separation from the physical body with the autoscopic type OBE, entering into darkness, and seeing a spiritual light. Often there are spirit guides and a decision of some sort to return to the body. There is considerable cultural variation of the experience, depending on the personal life history, age, religious background, and interviewer's belief system. The subjective experience is not one of a distortion or denial of reality but the correct perception of this reality from a bird's-eye view, followed by another reality being superimposed over this one.

Explanatory Models

From the clinical perspective, it is important to understand when these experiences occur. Do they occur in the few minutes between the death of the body and the death of the brain, or are they artifacts of resuscitation, secondary falsifications after the fact?[101]

If they are secondary falsifications after the fact, they are of primary interest only to psychiatrists and psychologists striving to understand how the mind creates memories or the genesis of entities such as false memory syndrome. They would not be of use in grief counseling or dying situations because they would be meaningless hallucinations, reflections of the patient's clinical condition but unlikely to add anything to it.

If, however, they are real-time events, and do in fact represent the only objective evidence of what the dying process is like, then these experiences are of intense interest to pediatricians and other health care professionals. It does not matter to the clinician if these represent a final burst of neuronal fireworks within the brain or the spiritual entry into another reality. That is a question for philosophers and religious thinkers. To the clinician they would represent an important developmental phase of man, one that we will all encounter.

Secondary Falsifications

I believe that most physicians and scientists interpret NDEs as secondary falsifications, distortions of man's perception of his environment while the brain is malfunctioning. As Negovsky[54] speculates, "auditory perception may be preserved when areas of the cerebral cortex serving vision have ceased functioning and after motor activity has ceased." Without any mystical explanations we can understand why the dying and then revived person can tell us he or she heard the voices of physicians. The fact that resuscitated people in different countries can recall similar images seen by them during dying or resuscitation does not prove life after death. It can be explained by the dynamics of the disintegration of cerebral function caused by different resistances to anoxia of the various areas of the central nervous system.

Blackmore[102] has developed a computer model of the images the brain receives from the retina at the point of death. The macula may cause a persistence of light images as the brain dies. As the brain dies, she speculates that an increase in cortical acceptability could destabilize the uniform visual image we perceive and result in the perception of concentric rings, lines, and tunnels.

This model speculates that the OBE results from the dying brain attempting to reconstruct a model of the universe from limited sensory input. She points out that we are constantly constructing a model of reality from a wide variety of competing sensory input. When that input ceases, we rely on memories and fragments of perceptions to reconstruct a memory model of reality, from a bird's-eye view. Such a model would seem perfectly real.

The most articulate proponent of this concept is UCLA psychiatrist, Ron Siegel, one of the foremost experts on hallucinations. He points out that all of the elements of the NDE, tunnels, lights, religious figures, childhood memories, heavenly music, and the like are commonly seen in a wide variety of hallucinatory experiences. He sees the NDE as the dissociative hallucinatory activity of the brain and the common elements simply being common reactions of the central nervous system to stress coupled with cultural expectations and influences. His superb article should be read by anyone interested in this area and is difficult to adequately summarize.[38]

The psychiatric literature is in general agreement that the experience is triggered by death anxiety, psychologic stress, and the fear of death. Although Carl Jung had an NDE,[103] many articles addressing this issue use the reductionistic framework of Freud to analyze the NDE as a regression into an infantile state with the being of light representing the unconditional love an infant receives.[1, 25, 48, 63, 83] Bates and Stanley call NDEs "a new psychiatric syndrome."[90] Psychiatrist Appleby[104] in his review of the subject states "NDEs do not give any insight into death, but in what it can illustrate about psychological life."

The psychiatric literature is difficult to interpret because no clear-cut distinction is made between simple out-of-body states, most of which involve a sense of astral projection; the autoscopic out-of-body state of the NDE that involves seeing one's own body from a bird's-eye view; and autoscopy, a psychiatric syndrome of seeing one's double, usually from the waist up. In virtually all of these articles, selected case reports are presented to "prove" various viewpoints without any real effort to delineate these three distinct clinical entities.[105-107] These speculations are helpful in giving insight into why retrospective falsifications might occur, but the New Age psychologist Ring has no more data to support his speculations than the reductionistic Appleby, or, for that matter, the child who thinks he or she actually went to heaven.

William Calvin[109] presents the most coherent theory as to the mechanisms of secondary falsifications. He presents a woman who nearly died in a car crash who had a long period of amnesia during her recovery. Her friends told her that she spoke of being visited by Adam and Eve, and she insisted that they were actually present. This seems like the spiritual aspects of the NDE. In addition, however, as she recovered, she frequently made errors in mental processing. An antique dealer she knew well became the head of the water department. Her surgeon was misperceived as a merchant from Boston, and a painting on the wall sent her into long explanations of events and people who never existed.

Any time the brain is confronted with memory gaps and pieces of information that don't seem to fit, it will attempt to make its best effort at creating a memory and will believe it to be true. We do not remember dreams and memories precisely but are constantly recreating them.[108, 109] Memory expert Elizabeth Loftus[110] has convincingly shown that false memories are fairly easy to create in experimental situations simply through gentle questioning. Even well-trained interviewers can inadvertently create false memories through unconscious facial movements and subtle coercion that even the interviewer is unaware of. For example, a young boy was repeatedly, but gently, asked about receiving stitches at the hospital. Initially he denied having stitches, which was true, but soon evolved a story of a mouse biting

his finger and requiring so many stitches his mother fainted from the sight of blood. This newly created memory was then perceived as being real.

This retrospective falsification model depends on fragments of perceptions of a chaotic disorganized brain, which is either psychologically or physiologically stressed coupled with a secondary reorganization into a coherent story.

Real-Time Models

These models primarily depend on similarities between the known functions of the right temporal lobe and related structures and NDEs. They speculate that NDEs are either the dysfunction or normal function of the temporal lobe, depending on the philosophical outlook of the investigator. Because coma involves the cessation of cortical functioning and "wipes clean the slate of consciousness,"[111] these models depend on aspects of consciousness and memory being mediated by deep cortical structures. Although NDEs have been reported with isoelectric electroencephalograms, the electrodes used did not monitor limbic and deep temporal lobe activity.[112]

Researchers have described NDEs as neurobiologic events, either as temporal lobe dysfunction[113] or normal temporal lobe activity[114] occurring in dying patients. For nearly 100 years, patients with temporal lobe tumors were noted to have vividly real hallucinations superimposed over ordinary reality. These included seeing people dressed in white and other spiritual visions.[115] Most, if not all, of the 15 traits of the NDE as described by Moody, have been replicated either by electrical stimulation studies, seizures, or other pathologic conditions of the right temporal lobe based on my reading of the literature.

Case Report

J.R. is a 12-year-old right-handed girl, who came to my office for evaluation of a funny dream that seemed to mean she was going to die. It frightened her. Her past medical history was remarkable for migraine headaches that occurred every 1 to 2 months. She had also had a blackout spell while standing in line at a ski resort and lurched forward and broke her arm. She is otherwise in good health, gets excellent grades, and lives with her parents in a suburb of Seattle.

She stated that she had an intense headache and felt she had to lie down. While she was having pain, she felt herself "sucked out of my body, you know, and into the long tunnel." She floated to the ceiling of her room and looked down at herself "all miserable and in pain." She then traveled through the tunnel into a heavenly realm with bright colors that seemed to be flowers. She saw a shining castle. She did not encounter a spiritual being or see a spiritual light. She thought her mother would be sad, and she knew she would die if she stayed in this realm. She made a decision to return to her body.

The neurologic and physical examinations were entirely benign. Her electroencephalogram was read by a neurologist blinded for clinical details as showing abnormal right temporal lobe activity.

This case report is an example of a "real-time" NDE, except the patient was not near death or in an unusual amount of pain from her migraine headaches. She did have the perception she would die if she remained in the heavenly realm but certainly was not in any danger of dying. She did not lose consciousness, nor was this a dream, so there can be no question of confabulation or recall bias. She was referred to me by her neurologist weeks after telling him of the dream.

* * *

Most of the 15 elements of Moody's NDE have been described in the literature as resulting from temporal lobe seizures, electrical stimulation studies, or otherwise arising from deep temporal lobe and related structures. Penfield performed electrical stimulation studies of the right sylvian fissure and found that patients often heard heavenly music, saw vivid hallucinations of people, and recalled memories so vividly that they seemed to be three-dimensional and real. One patient is reported as saying: "Oh God, I'm leaving my body," and another saying "I'm half in and half out."[116, 117] Penfield described the major contribution of the temporal lobes to have to do with memory recording and retrieval, explaining both the preservation of the memory of the NDE, as well as the panoramic life reviews. He describes related hippocampal structures as containing the ganglionic record of the stream of consciousness.[118]

These structures allow the mind to interpret current experience and compare it to past experiences; this fits nicely with Blackmore's speculation that the OBE is simply a different interpretation of reality when normal sensory input is lost. The real-time model of normal temporal lobe function would reinterpret her model as follows: normal sensory input at the point of death ceases, so the temporal lobe becomes activated, generating images of people, heavenly music, beloved family members and pets, and blends them with memories that are vividly real. Having no reference point to our current shared reality, this would allow the mind to reconstruct an altered reality. West[119] uses the example of a man looking out the window, with a fire burning behind him in the room. As the night comes and light ceases from

outside the window, the man sees the fire reflected in the window glass, along with reflections of objects in the room. He might easily mistake these reflections as coming from outside. This perceptual release explanation of NDEs is agnostic as to the "reality" of those other images but only makes the point that the seemingly autoscopic OBE may simply be a reflection and reconstruction of an inner state. The only study of this issue, done on one patient, concluded that the OBE is an altered state of consciousness as opposed to a reactive fantasy or veridical experience.[120] As one child who had an NDE said to me, "It was kind of like floating out of my body, but it was also like walking into my mind."[121]

Neurologist philosopher Arnold Mandell[122] agrees that the kingdom of heaven can be found within this area of the brain. He also reports cases of temporal lobe seizures that are similar to NDEs and mystical states. Between seizures, some temporal lobe epileptic patients experience long-lasting religious conversions, permanent personality changes, and long-lasting beatific states. His hypothesis is that the hippocampus is the meeting place between the incoming senses from the external world and the incoming senses from memory and emotions, the internal world. During temporal lobe seizures, which involve the hippocampus, internal and external reality are out of sync and inner experience dominates. Karl Pribram is also quoted as saying that a lesion in the temporal lobe can create a state similar to mysticism.[123] The cessation of external input as the brain dies would similarly result in a predominance of input from memories, emotions, senses, and the other images such as spiritual guides, memories of a beloved grandmother, preconceived ideas about god and angels, and the rest of the aspects of the NDE.

Unfortunately, when electrical stimulation studies were done, the clinical entity of NDEs had not been described. Van Buren,[124] for example, describes a 19-year-old man who had temporal lobe seizures. His aura consisted of "auditory and visual hallucinations that changed interpretation of self and surroundings." More detail is needed before concluding he was describing an NDE. There is tremendous variability in mental responses to temporal lobe stimulation, even when the same spot is stimulated twice in the same patient, so it should not be surmised that these events are static memory chips awaiting to be activated. Also we are not given many details as to what clusters of symptoms were often seen together; responses such as feeling unusual heartburn, a sensation of wanting to belch, or fear and anxiety are reported as often as "patient reports seeing flashing, fluttering, blinking, or undescribed lights." When memories of past events are recalled, they are often reexperienced as if they were really happening. Often patients are sparsely described as having "hallucinations of complete scenes" without further detail.[125]

Further support of this theory of hippocampal disruption resulting in increased mesial temporal lobe contribution to our perceived image of reality comes from findings that LSD acts by a similar process. LSD is known to produce images identical with NDEs. I applied Ring's Near Death Validity Scale[68] to published accounts of reports of LSD used in therapy on dying cancer patients and found that many of the accounts scored as moderate or deep NDEs.[126] Halgren et al.[125] comment that two other conditions (other than temporal lobe stimulation) associated with hallucinations, natural sleep and LSD, are also associated with profound disruption of hippocampal neuronal activity. The behaviors that suggest chimpanzees are having hallucinations from LSD are not effected by frontal lobectomy yet are stopped by temporal lobectomy.[125] Spiegel and Jarvik[127] also comment that the effects of LSD are similar to those seen in temporal lobe stimulation studies.

These similarities of NDEs, temporal lobe stimulation studies, temporal lobe seizures, LSD-induced hallucinations, and mystical states imply all of these are associated with similar brain states, regardless of the primary mechanism of the differing clinical entities. This real-time temporal lobe model for NDEs works equally well for those who describe the experiences as artifacts of temporal lobe function[128] or for those who consider them to represent the normal functioning of the human brain at the point of death.[114] Activation of this area of the brain could occur in the entire spectrum of clinical situations producing visionary and NDEs.

A variety of different neurotransmitters and neuronal receptors are speculated to be involved with NDEs, including serotonin,[129] endorphins,[130] or L-glutamate. As for the latter, Jansen[131] states that NDEs are in fact a by-product of the brain's attempt to heal itself at the point of death. The neurotransmitter at N-methyl-D-aspartate receptors is probably L-glutamate, which can kill neurons when in excess. The release during ischemia of an endopsychosin that may function as a protective blocking agent could serve the function of minimizing brain damage and could have dissociative side effects on consciousness.

Real-time models regard the NDE as occurring in the final moments of consciousness. There is philosophical dispute as how to interpret them, ranging from seeing them as an artifact of neuronal dysfunction, a real experience linked to normal temporal lobe function, a possibly harmful experience wasting precious energy on generating hallucinations,[54] or pos-

sibly helpful in blocking the harmful effects of ischemia while generating a pleasing dissociation fantasy.

Report of a Combined Retrospective/ Prospective Case-Control Study of Childhood NDEs

In 1985 our research group at Seattle's Children's Hospital published initial results of a combined retrospective/prospective case-control study of pediatric NDEs designed to clarify these issues.[114] This represented the first large-scale study of children's NDEs, as well as the first prospective case-control study of NDEs in either children or adults. Our final report was first accepted for publication in the *Journal of Pediatric Oncology Nursing*.[132]

Our experimental group consisted of 26 critically ill patients, who had life-threatening events with a 10% or greater mortality given the care in our pediatric intensive care unit. This group was compared with 121 seriously ill control patients with life-threatening conditions with a low mortality rate. Both groups were age and sex controlled; had a similar range of abnormal blood gases; were treated with the same medications including benzodiazepines, narcotics, anesthetic agents, and seizure medications; were mechanically ventilated and intubated; and were subjected to the psychologic stresses of the intensive care unit environment.

There were 26 critically ill patients, 16 retrospectively identified from chart reviews during the period of 1975 through 1985, and 10 prospectively identified from 1985 through 1992. They included survivors of cardiac arrest (18), profound coma with Glasgow coma score lower than 5 (7), and diabetic ketoacidosis with blood sugar of 2398 mg/dl (1).

The control patients were age and sex matched to the critically ill patients. One hundred twenty-one control patients included tension pneumothorax (4), head injury with Glasgow coma score greater than 5 (23), epiglottis (9), asthma (6), cardiac surgery with cardiac bypass (19), elective surgery (20), drug overdoses including narcotic overdose (11), pneumonia (8), idiopathic hypotension (1), Guillain-Barré syndrome (2), diabetic ketoacidosis and coma (3), near drowning (15). These patients were treated with narcotics, benzodiazepines, anesthetic agents, anticonvulsants, barbiturates, and cardiopressors such as dopamine and levophedrine. There were no significant differences in peripheral blood gases between the control and experimental group, and individual control patients had arterial blood gases of all extremes including a Po_2 as low as 42 mm Hg, Pco_2 as low as 11 mm Hg, and a Pco_2 as high as 98 mm Hg. Seventy-two percent of parents of control patients answered "yes" when asked, "Did you think your child was likely to die?"

The authors had no preconceptions as to what constituted an NDE at the onset of this study, and any memories a patient subjectively perceived as occurring during the time of unconsciousness qualified as an NDE. This was done to clarify whether NDEs are simply a subset of intensive care unit psychosis. An interview format was developed with 16 open-ended questions such as "What do you remember happened to you when you were in the hospital?" Once the open-ended questions were asked, then a second questionnaire requiring "yes" or "no" responses was administered, with questions such as "Did you see a light?"

Twenty-two of 26 critically ill children described memories of being clinically dead, and furthermore virtually all of the memories were consistent with previous anecdotal collections of adult NDEs. All of this information was obtained in the open-ended question phase of the study, and no new information was obtained from the "yes or no" direct questions. Only one patient described a distortion of reality, saying that when she was floating over her body, although she accurately described her own resuscitation by medics, her mother's nose appeared flattened and distorted "like a pig monster." In all other cases the patients were oriented to time, place, and person and aware that they were critically ill but sometimes described another reality superimposed over the one they ordinarily perceived. They often subjectively perceived themselves as being awake and alert while seemingly in a coma and believed the entire experience was real. In fact, one 6-year-old boy emphatically stated "It was real, Dr. Morse, it was realer than real."

The content of the experiences was usually described as a fragment of a greater indescribable experience. One 8-year-old boy stated: "I have a wonderful secret to tell you. I was climbing a staircase to heaven. It was long and dark and I could see a light (that was heaven). I came back because my brother had already died and it wouldn't be fair (if I continued)." This is the entire description of his experience and all other questions were answered with "I don't know (or remember)." Another 6-year-old boy stated "It was weird. I thought I was floating out of my body. And I could see a light. There were a lot of good things in it." Again, he could not further define what this light was or what he meant by "good things" in it. A 5-year-old girl described the light as "It told me who I was and where I was to go." A 12-year-old girl stated: "I learned that life is for living and that light is for later." This was her complete

statement about her experience, only further stating that she was somewhere besides her own body but couldn't say where else she was or what else happened to her.

One case strongly suggests that NDEs occur at the point of dying. A 14-year-old boy with documented long QT syndrome (Romano Ward syndrome), sick sinus syndrome, and juvenile-onset diabetes experienced a pacemaker failure, resulting in recurrence of ventricular tachycardia and fibrillation. He described floating out of his physical body and watching his own resuscitation from a corner of the room, surrounded by a soft white light. He could "see my hair all messed up. They cut off my clothes and hooked me up to IVs and stuff. I saw the nurses put some grease on me and then Dr. Herndon put paddles on my chest and pressed a button. I was sucked back into my body. That hurt. I have never hurt so much. Sometimes I still wake up at night and feel that hurt."

Dr. Paul Herndon, chief of cardiology at Children's, and nurses present independently verified that within minutes of this patients's successful resuscitation, he regained consciousness and said: "You guys just sucked me (or pulled me) back into my body."

Only four patients described a coherent experience that made sense when told from beginning to end. For example, one 5-year-old child had a cardiac arrest as a result of fulminant bacterial meningitis. She stated that she floated out of her physical body and saw the doctors and nurses working on her. She rose up into the air and saw a man she thought was Jesus "because he was nice and he was talking to me." While in this heavenly realm, she saw "the dead people, grandmas and grandpas and babies waiting to be born." She saw a light that she drew as being a rainbow and stated it "told her who she was and where she was to go." She said that "Jesus told me it wasn't my time to die" and she regained consciousness. (A drawing of her NDE is shown on the cover of this issue.)

A 10-year-old boy, who survived a profound coma from nearly drowning, reported that hands reached into his body while "I was drowning." He had a terrifying experience of being plunged by these hands into total darkness. He did not know whose hands they were or why this happened to him. Eventually the darkness dissolved into a beautiful heavenly scene of golden fields and rainbows. He became frightened again, thought he would die, and never see his family again, and subjectively returned to consciousness.

An 8-year-old boy nearly drowned as a result of his parents' car swerving off an icy road and plunging to the bottom of a river. His rescue and subsequent recovery were quite dramatic, earning his rescuer, a passing motorist, Washington state's highest award for heroism. He states "I could see the car filling up with water, and it covering me all up. Then everything went all blank. Suddenly I was floating in the air, I felt like I could swim in the air." He was very surprised to still be thinking as he knew he must have died. "Then I floated into the huge noodle. Well, I thought it was a noodle, and when I told my mom about it, I told her it must be a noodle, but maybe it was a tunnel. Yeah, it must of been a tunnel because a noodle doesn't have a rainbow in it." He described the tunnel branching into two passageways, and he inadvertently went down one to "the animal heaven." There were flowers and a bee that spoke to him. He then went into the "human heaven" and "I saw a castle, it was just a regular old castle, not all broken down, I really didn't go to see it, but I could just picture it in my mind. I just had an idea of what it looked like." He then, for reasons unknown to him, returned to consciousness. He was very surprised that he continued to live after thinking he was dead and believed that old people (faced with death) would also want to know.

A 5-year-old boy had a tracheostomy for severe tracheomalacia. He had a total of three cardiac arrests during his life, at age 4 months, 8 months, and 2 years. At age 3, when his parents took him to a Christmas pageant, he began protesting, saying the figure on the stage was "not my Jesus." By age 5, he reported to his parents that when he was an infant, he almost died. He floated out of his body, and saw his grandmother and mother hugging each other and crying. He continued to float straight up until he saw a dark tunnel. He perceived himself as crawling down the tunnel and entering into a brightly lit heavenly realm, where he "ran and double-jumped with God." His parents and he believe that this experience occurred during his respiratory arrest at age 8 months, which was long and complex, requiring 45 minutes of chest compressions.

Most of the children simply told fragments of an experience. All of their fragments, when taken together, give us an understanding of a core NDE, strikingly similar to those previously described in adults, yet different in important ways. There was a sense of being dead (21), seeing a light (18), separating from the physical body (16), going through a tunnel (12), seeing dead relatives (10), seeing living teachers and relatives (6), seeing pets (6), seeing angels (9), seeing a godlike being (8), deciding to return to the body (12), and a sense of peace and joy (8).

For example, one child described three distinct fragments of an experience. First, she could see her

own body as doctors wearing green masks tried to start an IV. Then she saw her living teacher and classmates at her bedside, comforting her and singing to her (her teacher did not visit her in the hospital). Finally, three tall beings dressed in white that she identified as doctors asked her to push a button on a box at her bedside, telling her that if she pressed the green button she could go with them, but she would never see her family again. She pressed the red button and regained consciousness. This very mechanistic experience comes from a child raised in an agnostic family.

An 8-year-old girl was brought to our office in coma from fulminant liver failure from mononucleosis. Her resuscitation included the use of intracardiac epinephrine. She has a long memory gap from the time she was at home, eating a push-up popsicle the night before her presentation, until she regained consciousness several days later. Embedded in this long memory gap is a distinctly vivid image of seeing her beloved but dead grandmother sitting at her bedside, very calm and peaceful. "I was just so shocked to see her," the girl stated, because she knew her grandmother was dead but seemed to be alive. The grandmother was surrounded by white and blue clouds. The girl then stated "and then I was back." When asked what this statement meant, she said "that's what I have been trying to figure out." She is certain that the appearance of her grandmother coincided with her cardiac arrest because she states that she could hear the nurses saying that they had to "get that crash cart thing really quick" during the time she saw her grandmother. She has no other memories of her experience, but comments that "I am not afraid to die anymore because now I know a little about it. I always used to believe in heaven, but now I know that we still live (after we die)."

Many patients had even briefer fragments than these, which were very hard to interpret. One girl with chronic renal failure had a cardiac arrest when her potassium rose to 8.4 mEq/L. She responded to cardiopulmonary resuscitation including chest compressions. She awoke crying that she had a frightening experience of being in her classroom at school and being scolded by her teacher. Several children simply said they had a "weird dream" that they were flying or floating. Several children said that they saw a "bright light" but made no further comment of any sort. One girl said "I thought I heard something saying something to someone." One boy reported "I think something happened but I can't remember it, maybe I went somewhere with someone." Four children said that they could remember something happening but then were unable to say what it was they remembered. Several children said things like "maybe Mrs. Jenkins helped me (a living teacher)" or "I petted my dog."

No control patients described any memories of the time they were unconscious in the hospital, except for two patients having elective surgery who described being conscious during surgery. One patient had elective surgery for an orthopedic procedure, and described recurrent nightmares that she had actually been awake during surgery. She recalled hearing the surgeon ask for new gloves and other comments during surgery. This awareness during surgery has previously been documented in the literature,[133] and a review of both of these patients' medications indicated that they may have been underdosed with amnesic agents. Other than these two patients, all other control patients simply said that they could not recall anything referable to the time they were sick until they regained consciousness, usually not until they were on the ward or at home. One fascinating aside is that these patients did not subjectively describe regaining consciousness often days or even weeks after friends and family believe they have regained consciousness.

Our study suggests that there is a core NDE that is inexorably intertwined with the processes of dying. It involves a sensation of being dead yet conscious, separating from the physical body, hearing and seeing events surrounding the physical body, seeing relatives and comforting images, entering into a loving light, and often perceiving a decision to return to the body. It was independent of medications, hypoxia, hypercarbia, psychologic stress, or the perception that one was dying. It appears to be a real-time event at the point of death; the fragmentary nature of most of the reports coupled with the lack of any experiences at all in the control patients argues against secondary confabulation being the primary mechanism of the experience.

Our study clarifies the distinction between post-surgery psychosis and NDEs. The psychosis of open-heart surgery is thought to be a reaction to the unbearable thought that one's heart has been operated on, sensory overstimulation, and emotional stress. The content of such experiences includes paranoid feelings about the staff, monsters coming out of the television set, and phantoms who lay in bed with the patient.[134] Although Blacher describes such psychotic events in 8 of 12 adults, we simply did not find them in our 121 control patients. Children may be less likely to have psychotic reactions to such emotional stresses because they had a different developmental appreciation of death than adults.

We have studied 400 Japanese NDEs and 50 native African experiences collected at the University of Zambia and found the same core experience as seen

in American children. For example, in a retrospective study of over 400 Japanese NDEs, Japanese adults described a wide range of experiences in keeping with their cultural traditions. However, Japanese children similarly describe simple experiences of seeing a bright light or seeing living teachers and playmates. A 4-year-old boy, who had fulminant pneumonia, described floating out of his body and coming to the edge of a river. His playmates were on the other side, urging him to go back. There was a misty bright light on the other side. (In 1989 and 1990, my research assistant, Shannon Greer, spent several months in Japan. She met with Hiroshi Tanami and Takashi Tachibana, Japanese journalists who studied and reported on JHK television their study of 400 Japanese children and adults. The specific anecdote is courtesy of Akiko Murakoshi, MD, a Japanese pediatrician.)

The core NDE is then secondarily interpreted according to the age and culture of the person experiencing the event. For example, the tunnel and the life review are culture-bound phenomena not linked to the core experience.[135] The child often describes heaven as being filled with flowers or perhaps a pup tent on a golden field and Jesus described as looking like Santa Claus or being "very nice." The being of light is variously described as a wizard, a doctor, an angel, a living teacher, or god. Adults often describe dead relatives, whereas children often describe guardian angels, living teachers and playmates, animals and pets. Even negative NDEs have been described as often being similar to the events of the positive NDE with a different interpretation placed on the experience.[136]

Every study that addresses the issue of the timing of the NDE, in the literature that I am aware of, supports Burch's original assumption that the NDE reflects the last few minutes of human consciousness. Sabom reported six patients who reported specific events that occurred during their resuscitation, which presumably could not be confabulated, including the exact number of defibrillation attempts, precise descriptions of the ordering of procedures and medications, and comments by staff members. He then interviewed 25 control patients who had no memories of their successful cardiac resuscitation and found that 20 of them made major errors in attempting to describe their own resuscitations.[73]

Levin and Curley[137] found that 60 pediatric intensive care unit nurses at Boston Children's Hospital described a total of 13 pediatric NDEs. Seven of these experiences were told to nurses immediately after recovery, and one was reported during the experience. Unlike our study of cardiac arrest and coma, these children's diagnoses were cancer, cystic fibrosis, renal transplantation, and postoperative surgery, demonstrating that NDEs occur in a wide variety of clinical situations.

von Lummel,[138] in a multicenter prospective case control study in Holland, has preliminary data that describe 15% of critically ill patients as having NDEs involving the previously described core cluster. A review of his entry criteria confirms our finding that the closer one is to death, the more likely an NDE is to be reported. Most of his study population who didn't have NDEs would have been control patients in our study. (In October 1991, I met with the Dutch research group Merkawah in The Netherlands and we reviewed our data.) Owens, Cook, and Stevenson,[139] while reporting that NDEs occur in patients whose medical records do not verify clinical death, state that those patients who do survive clinical death have a unique transcendent quality to their NDE. This is consistent with Noyes and Kletti's finding that patients close to death describe a transient depersonalization syndrome, but once death is considered to be inevitable, they then described transcendent experiences.[60] Finally, a nurse at Hartford Hospital states a patient described an NDE in which she saw a red shoe on the roof of the hospital during her OBE. A janitor later retrieved a red shoe. Ring[140] describes three such cases involving shoes, shoelaces, and a yellow smock and recounts a similar anecdote of a Seattle social worker who also retrieved a shoe outside a window ledge that was identified by a patient during an NDE.

This evidence clearly suggests that NDEs in fact occur when they are subjectively perceived as occurring, at the point of death. As such, they must represent the best objective evidence of what it is like to die, regardless of which neurotransmitters or anatomic structures mediate the experience. They are as real as any other human experience, as real as math or language. They occur to subjects with isoelectric electroencephalograms, suggesting that deep temporal lobe and associated limbic structures mediate the experience and that memory and perception of consciousness do not depend on functioning cortical structures. (Personal communication with Denver cardiologist Fred Schoonmaker, December 9, 1993. He has done electroencephalograms on his own patients resuscitated from cardiac arrest and documented that 70 to 75 patients with isoelectric electroencephalograms reported NDEs. He did not use temporal or deep cortical leads.)

Long-Term Effects

One piece of circumstantial evidence that NDEs represent a real-time event and not a reactive fantasy is that long-term follow-up of these experiences docu-

ments that they cause significant personality transformation. Although prospective studies documenting pre- and postexperience personality and cognitive profiles have not been done, retrospective studies with proper control groups document that persons having NDEs have decreased death anxiety and higher scores on scales of profiles of adaptation to life. Pathologic hallucinations require numerous episodes and time to affect personality,[141] whereas a single brief NDE can be "a powerful mediator of attitudinal change."[83]

We studied 100 adults who had NDEs as children and tested them with a battery of psychologic tests, including the Ellsworth Profile of Adaptation to Life Survey, Greyson Value Survey, Greyson Near Death Validity Scale, Templer Death Anxiety Scale, Reker-Peacock Life Attitude Profile, Neppe Subjective Paranormal Events Questionnaire, Neppe Lobe Sensitivity Inventory, a complete medical and psychiatric history, family bonding and rating scales, Weinbeerger Anxiety Inventory, and open-ended essay questions. They were compared with control groups of 50 subjects each including (1) parents of children in a private suburban pediatric practice, (2) adults who nearly died as children but did not have an NDE, (3) adults who describe themselves as being New Age Christians or Humanists, (4) adults who describe themselves as having psychic powers, and (5) adults who had spiritual experiences of a mystical light as children not in the context of illness.

We found that children who have mystical experiences of light, either in the context of illness or not, have a similar psychologic profile to adults. This profile includes low death anxiety; few symptoms of repressed anxiety or depression; lower self-reporting rates of drug and alcohol use or use of over-the-counter health products; increased self-reporting of time spent meditating, eating fresh fruits and vegetables, and exercise; more time spent alone and with family members; and statistically significant increased scores on tests of general mental health and spiritual well-being. These adults self-described themselves as giving more money to charity and spending more hours a week in volunteer activities. In contrast, adults who nearly died as children but did not have an NDE had increased death anxiety, increased repressive and defensive symptoms, and evidence of posttraumatic stress syndrome. The other control populations scored in the normal range of these various tests as had been previously reported for control populations.[18]

Our study replicates and confirms previous similar studies in adults.[142-144] It is, of course, unknown whether these observed differences represent predisposing factors or the consequence of the experience. Lock and Shontz[145] compared those who had come near death with and without an NDE on scales of intelligence, extroversion, neuroticism, and anxiety and found no significant differences. In contrast, Kohr[146] reports an association of cognitive style with the NDE characterized by an interest in paranormal experiences, dreams, and meditation, a quality of openness, and an ability to direct attention inward. This difference in cognitive style could exist even in young children and could account for why a few children have complex NDEs, most have tiny fragments of the experience, and some have no experience at all. Severe child abuse, well known to be a dissociative event often triggering multiple personality disorder,[147, 148] could alter a child's cognitive style, resulting in increased likelihood of having NDEs. NDEs and multiple personality disorder may well be opposite ends of a spectrum of dissociative abilities of the human brain.

Relationship to Other Death-Related Visions

Research on NDEs validates a host of death-related visions, including premonitions of death, predeath visions, and postdeath visitations, all of which have been described in children. It is my opinion that death-related visions play an important role in understanding the dying process. NDEs cannot be understood as an isolated phenomenon but should be interpreted as being a part of a spectrum of spiritual events that happen to the dying, their families, and caretakers. The salient feature of the NDE is that it is a mystical spiritual experience superimposed over ordinary reality, which is also the hallmark of the death-related vision.

Anecdotal collections of predeath visions have been reported for nearly 100 years, with comparable phenomenology to NDEs. Sir William Barrett, professor of physics at the Royal Academy of Science in Dublin, in 1926 meticulously collected anecdotes of predeath visions in children and adults at the turn of the century. For example, he describes a 10-year-old child who was dying of "bilious fever." One afternoon she lay in bed and seemed to look at a place above the door. She told her father that she saw a spirit "and it is Jesus. He says that I am going to be one of his lambs and go to heaven with him." She died 4 days later. She made statements to her parents such as "Mommy, after I am gone, the Comforter will come to you, and maybe he will let me come sometimes. I'll ask Allie about it (her sister who had previously died)." Barrett comments that the experience was not influenced by cultural expectations. The family's minister told the girl that "she would go across the dark river soon." The girl replied "it is all

a mistake, there is no river. It is here and there, I see them here at the same time as seeing you. I cannot describe it, it is so wonderful, it is different, I could not make you understand." The girl was similarly puzzled when a neighbor asked her about the heavenly city, which she also did not see. Another case described an 8-year-old girl who died of diphtheria. "She had roused and had bidden her friends goodbye, when suddenly she said: why papa, I am going to take Jennie with me, why didn't you tell me Jennie was here?" She then died. The family only later learned that the girl's best friend Jennie died of diphtheria the day before. It is remarkable that Barrett's book written only 70 years ago describes virtually every deathbed scene as being attended by family, friends, one or two physicians, and a nurse.[149]

Gruen[150] analyzed parents who had vivid premonitions that their infants would die of sudden infant death syndrome (SIDS) from a psychoanalytic viewpoint. He describes parents who had vividly real dreams or waking visions of a spiritual nature. He concludes that the premonitions are the result of unconscious maternal conflicts about the infant.

More recently, Yale pediatric oncologist, Diane Komp, reported children who had an experience similar to NDEs before their deaths, except that the experiences occurred in "dreams, visions, or prayer and the children were infrequently brain dysfunctional at the time." For example, one 8-year-old boy dying of cancer, whose parents had avoided talking to him about death, told them one day that he dreamed that Jesus had pulled up to his house in a big yellow school bus and invited him aboard, telling him he was to die soon. A 7-year-old girl, dying of leukemia, sat up and said "The angels, they are so beautiful, can't you hear them singing Mommy?" immediately before her death. One boy dying of central nervous system leukemia stated that God spoke to him and that he asked God to live another year so the boy could explain his death to his 3-year-old brother. Dr. Komp stated that after this vision, the boy in fact lived 1 more year, something she believed was medically impossible. A man reported to her that when his son died after a car accident, he thought he saw a halo of light around his son's head and heard the words "don't worry, I'm all right," an experience that he did not believe until he heard about other death-related visions.[151]

Elizabeth Kübler-Ross describes dozens of death-related visions including predeath premonitions of sudden death, visions before and during head injury and coma, visions surrounding missing and murdered children, death-related visions relating to childhood suicide, and postdeath visitations. She describes a 7-year-old boy dying of leukemia who had visions of heaven that played a role in his stopping his own medical treatment. "In an unusual mixture of mysticism and courage, he said, 'Mother turn off the oxygen, I don't need it anymore.' With a big smile on his face, he said: 'it is time,' and then he left." She describes a 4-year-old girl who was murdered, who had a vivid dream the night before her murder. The girl was very excited, said that she had been to heaven, that it was "really, really, real," and that she saw Jesus, "a beautiful golden heaven with gold angels, diamonds, and jewels and she had fun there. She told her mother not to worry because Jesus would take care of her" and then went out to play. She was murdered only hours later.[152]

A handful of case reports and studies exist in the medical literature also documenting the similarities of NDEs and other death-related visions. A 10-year-old girl with leukemia had several experiences during bone marrow transplantation. After the third unsuccessful attempt, she told her nurses that she "had seen the light" and "spoke to Jesus." She told her best friend that she had been through a tunnel and had come back to say goodbye to her (the friend).[153] Ossis and Harroldson[154] surveyed 5000 physicians and nurses in the United States and 704 in India and collected 471 cases of predeath visions. They were typically brief, within 24 hours of death; dead and living relatives were often seen, and the purpose of the experience was to take the dying person away and to provide comfort. There was no potential effect from medication in 80% of the cases. For example, a 4-year-old Hindu boy dying of leukemia stated immediately before death: "don't you see my mother (previously deceased), she is calling, she has her arms open for me."

Barrett et al.[155] report in a prospective case-controlled study that dying adults have a marked increase in hallucinations of apparitions in the final week of life.

Shared spiritual experiences with dying patients are also reported, which again are strikingly similar to NDEs. An off-duty nurse described a vivid dream in which she accompanied one of her patients through a tunnel into a spiritual light, which occurred at the same time her patient died in the hospital. She stated that during the dream "we burst out into the open-bright light all around us. I felt incredibly peaceful and good. Then I thought, I can't stay, it isn't my time, I have things to do. I looked (at her patient). She had already become part of that glorious white light."[156]

A teenage girl shared the dying experience of her brother who died when a car struck him while riding his bicycle. She was at home when he was fatally injured. His mother was called and immediately went

to his bedside at Harborview Hospital in Seattle and then returned home to tell her daughter. She found her daughter sitting in the living room stating that she was floating out of her body and in a heavenly realm with her brother, who showed her his death and told her it was all right. The teenager was able to simultaneously communicate with both her brother and her mother. She stated that this vision occurred before her mother told her of her brother's accident.[18]

A pediatric allergist had a vivid OBE coincidental with his son's death. He was present when his son drowned and dove into the water in an attempt to save his son's life. Suddenly and unexpectedly, he saw the entire scene from a bird's-eye perspective. He had the vividly real sensation of being out of his physical body and saw the scene below him, including his own body. He felt completely peaceful and emotionally detached, "the sort of empathy that one might feel with a patient, yet not really feeling." He states: "I knew that there was someone behind me, watching the 'two me's,' and what was happening. He (I knew it was a male, adult, and highly spiritual) somehow conveyed to me (without speaking) that I had a choice to continue to feel peaceful or to return to that body in the water and return to great agony. I decided to go back down and immediately . . . was in the worst emotional pain I have ever experienced. Since then I think I know what happens after death and I see a lot more meaning in life" (personal communication with Clifton Furukawa, MD, December 13, 1993).

This was not a shared dying experience or NDE because he was not physically near death. Yet it has precisely the same elements and flavor of such experiences. This example is the exception that demonstrates the rule, in that the only common link it has with NDEs is that it is an important example that such experiences are clearly associated with our own deaths or the deaths of those we are emotionally attached to.

A retrospective case control study of premonitions of SIDS by the Southwest SIDS Research Group documented that 21% of parents had a premonition of their infant's subsequent death. Seven parents documented their premonitions in a journal before the death. A retrospective control group and two prospective control groups reported 3% to 5% of parents whose infants did not die of SIDS having premonitions and that the control premonitions were of a qualitatively different nature than the premonitions of SIDS. SIDS premonitions were of four distinct types, including perceptions of physical events such as gasping and choking spells, dreams and hypnagogic visions, spiritual visions, and vague uneasy feelings. The spiritual visions were similar to other death-related visions, including spiritual voices telling parents that the child was to die, out-of-body visions including angels who predicted the child's death, and a 4-year-old sibling sharing the infant's dying experience. The control premonitions were primarily vague feelings of unease.[157]

Postdeath visitations, often described as grief-induced hallucinations, are also well described in both children and adults. Although these experiences are again strikingly similar to NDEs and predeath visions, they are invariably described as a separate psychologic entity. They are typically described in the context of a dream or a waking vision as involving a vividly real hallucination of a dead relative, patient, or friend superimposed over ordinary reality. They often include spiritual intuitions and visions of a mystical light.

Anthropologist Lewis[158] randomly interviewed 108 London nurses and found that 35% reported experiences with dead patients, ranging from vague feelings to visual and auditory hallucinations. A pediatric nurse reported that she still felt the presence of a mischievous boy who died on the ward 15 months before her interview but could not explain her feelings further. In contrast, a midwife reported working on a surgical ward and seeing a vivid visual hallucination of a 14-year-old boy who had died; he was dressed entirely in white. These experiences were also intertwined with a sensation of a God, and the surveyed nurses reported the experiences as similar to NDEs.

Children have also been reported as describing visual hallucinations of deceased relatives, especially parents. Balk[159] studied 33 bereaved teenagers and found that they frequently felt that they heard, saw, or had actual contact with their dead relatives.

Simonds[160] described 5 of 10 bereaved children who had "audiovisual hallucinations" of deceased family members and only described one child as having unresolved grief issues. In Garralda's study[161] of psychotic hallucinations, he found that hallucinations in nonpsychotic controls were almost entirely confined to bereaved children who had hallucinations of a dead person. He further comments that these children had evidence of minor "temporal lobe dysfunction." Yates and Bannard[162] and Bender and Lipkowitz[163] also present cases of bereaved children who continued to visually perceive their parents after death.

These authors assume that the experiences are true hallucinations, meaning "false sensory perceptions not associated with real external stimuli."[164] No attempt is made to link these audiovisual perceptions of deceased relatives with the same perceptions seen

in dying children, children resuscitated from nearly dying, and adults who have premonitions of the death of a child or shared dying experiences.

All authors acknowledge that these experiences seem vividly real to those who perceive them. This serves as an important distinction between these experiences and the experience of an imaginary companion, which Sekaer[165] describes as "always known not to be truly real." Sekaer, also a psychotherapist, acknowledges the distinction between the vividly real quality of the "imaginary parent" of the bereaved child but only states it is interesting, without further comment.

The nature and incidence of postdeath visitations has been more quantitatively studied in adults. Rando,[166] without data presented, states that a significant proportion of adults will have "hallucinations" of infants after they have died of SIDS. In 1769 Charles Bonnet[167] described adults who had pleasant visions of deceased relatives and other presumed hallucinatory experiences in the context of sensory deprivation, and such experiences are reported as the Charles Bonnet syndrome.[168, 169] Other authors have described visions of dead relatives in the bereaved without psychopathology or sensory deprivation.[170]

Rees[171] reported 50% of widowers reported visions of departed spouses, which occurred to them while in the waking state. Harroldsson,[172] in a national survey in Iceland, reported that 31% of respondents reported visual encounters with the dead. Kalish[173] studied adults in Los Angeles and found that 55% of blacks, 54% of Mexican-Americans, 38% of Anglo-Americans, and 29% of Japanese-Americans reported such encounters. These experiences have also been reported in traditional Hopi Indians.[174] Early accounts in adults also contain elements that could not be explained by reactive grief reactions, such as living persons seeing apparitions of the dead before their knowledge of the death.[175] The fact that these experiences are so common has led one investigator to advocate abandoning the word "hallucination" to describe them.[176]

Clinical and Theoretical Implications for Health Care Professionals

It is my opinion that these experiences all represent a spiritual dimension to the dying process, a continuum from the predeath vision, the shared dying experience, the NDE, and the postdeath visitation. It has already been pointed out that virtually no studies of anticipatory grieving or behavioral interventions in the grieving process exist in the medical literature and that virtually all reports depend on an appeal to authority, meaning that commentators simply cite various authorities in the field that have made various statements in the context of anecdote without supporting data.[177, 178] It is my intent to present a new theoretical framework to understand these previously isolated clinical entities so as to stimulate research on the effects of these powerful spiritual events on dying patients and grief. Clinicians should recognize that these experiences can be used in a therapeutic context without entering the philosophical debate as to their objective reality. Such interventions are filled with therapeutic pitfalls because death, the limitations of medical technology, and spiritual visions are emotionally laden and somewhat taboo subjects in our society.

My experience is that these experiences simply need to be listened to and validated by health care professionals. Death-related visions should be accorded the same respect and dignity that we extend to mothers with colicky infants or parents raising children with attention deficit disorder, two equally mysterious clinical entities. Death is not simply the end of life but another developmental stage, and these experiences are part of the final stage of life.[179, 180] They require only a letting go of our desire to control, explain, and interpret life events for our patients. Simple affirmations and time spent listening, crying, or simply holding hands at the bedside are the interventions most likely to be of benefit. I have been involved in many cases in which a discussion of spiritual visions led to anger and conflict. Invariably, the reason for such an outcome resulted from well-meaning attempts to interpret or control the experience.

These Experiences Can Restore Dignity and Control to the Dying Process

Dying can be a depersonalized, spiritually degrading, and dehumanizing process. Patients often die alone stripped of personal dignity. They feel useless and a burden to their families, often draining financial resources for terminal care of minimal benefit.

The death of a child is no different. Children feel the same social isolation, loss of dignity, loss of body image, and loss of autonomy that adults feel when confronted by their own death.[181, 182] Studies that show that children have a different developmental perception of death were done on healthy children, and it is clear that children who are faced with death know what death is and have similar concerns about death that adults have.[8, 183, 184] Children suffer from a lack of empowerment and control over their lives when confronted with death and the therapies used to treat their illness.[185]

If it is understood that dying and comatose patients are often conscious and capable of emotionally

processing information, family members and friends may want to spend more time at the bedside. Anticipatory grieving, life reviews, dialogues, and education concerning the spiritual perceptions of dying patients may well reverse the isolation of the dying patient. Spiritual visions can empower the dying patient in that they still have something important to share with others. I am aware of many cases in which children have used their spiritual visions to comfort their parents about their impending deaths. Such statements can be enormously comforting and allow the child to feel powerful and in control.

One important issue for children is to know what will happen to them when they die. Parents and health care professionals can present what is known of near death research in a straightforward manner and simply explain what other children and adults say they have experienced when they underwent the dying process. It is certainly scientifically responsible to state that the process of dying is not painful or scary and that people often think that they leave their body during the very times when the most painful and invasive things happen to dying patients. Cardiopulmonary resuscitation with chest compressions, intubation, intravenous line placement, and other resuscitative and life-sustaining techniques can seem painful and scary to dying children, and it may be comforting to know that other children who have had such experiences did not feel pain but thought they were floating on the ceiling looking down. It may be comforting to know that it is possible to still hear and see one's parents, friends, and relatives during the process of dying. It is generally agreed that dying children often see angels, dead pets, favorite living teachers and friends, or dead relatives; this information can be shared with children without controversy as to the cause.

It is essential to understand that paranormal beliefs without a societal context to place them in does not help patients confronted with death.[186] Just as the medical community is in conflict as to the underlying cause and meaning of death-related visions, patients and their families will often have the same conflicts. I had a case involving a young boy who was dying of leukemia. His mother and he had shared dreams in which they both previewed a heavenly realm. The visions served to make the father feel isolated and left out, somehow less spiritually worthy. Another sibling felt that he was a "bad boy" and envied his brother who had leukemia and wondered why he couldn't see heaven. After the boy died, these feelings intensified. The mother was preoccupied with mysticism and attempting to relive the visions. The father felt isolated and misunderstood. The son felt his parents were mad at him because the good son who was privileged enough to see heaven was the one who died. All of this was superimposed over the more routine feelings of guilt and despair often associated with dying.

In contrast, these same visions can give families courage and confidence. I am aware of a case in which a young boy had spiritual visions in which he anticipated his death from leukemia. His physicians believed that further medical treatment would not prolong his life, and he withdrew from treatment and returned home. His spiritual visions played an important role in his family's understanding and acceptance of his desire to stop treatment and was one important factor in a complex decision-making process. His mother wrote to me: "You asked me what it was like to be at the bedside of a dying child. That made me laugh because Sean died on the living room floor. The last few weeks he was very restless and wanted to be on the sofa or the big chair or on his sleeping bag on the floor. If he had been in the hospital we couldn't have done that. I really don't know what exactly you are asking.

"If you mean, how did it feel emotionally, it was the most terrifying and at the same time the most moving thing I've ever experienced. It was awful to see my child grow sicker and weaker day by day and be able to do nothing to stop it. At the same time it was wonderful to be able to care for him, hold him when he wanted it, fix his favorite foods, even if he didn't eat it, watch him wait anxiously for 3 PM when his sisters came home. It required every ounce of strength I had to get through it. Sometimes I felt like I was going to explode into a million pieces and often I wished that I would die too, even though that would not be fair to my daughters and husband. I don't know what my husband thought during this period. I have never asked him.

"I really believe that if the parents are not ready or willing to let the child go, then the dying can drag on and on. Most parents I have talked to were not like us though. They wanted to keep trying to the bitter end, even if there was almost no chance. These parents seem to have a harder time grieving. One lady I have been writing to has an 8-year-old daughter who died of leukemia. The doctors told her it was fatal, but she wanted to try everything. That girl went through hell. She was in the hospital the last 6 months . . . when she finally died, she said: 'I failed, I'm sorry.' After Sean died, no one wanted to talk about it. Most Americans are afraid of death. It leaves us bereaved parents in a very bad state."[18]

It is my opinion that this boy's spiritual visions were part of the mother's ability to successfully grieve and played a role in his dying at home. I believe that if his physicians had trivialized his spiritual visions

or dismissed them as fantasies or meaningless hallucinations, his mother would have been less likely to have gained spiritual support from them.

It is not necessary to have a spiritual vision to achieve the same result. Gardner[187] reports a case of David, a young boy dying of leukemia at Denver Children's Hospital. He was initially taught self-hypnosis for pain relief and control of vomiting. He soon enjoyed the sense of control and mastery self-hypnosis gave him and he even tried to hypnotize the family dog. He used the image of a soaring eagle in his hypnosis to prepare himself for dying. He died in his father's arms, as his father told him to soar like an eagle to a safe place. The experience was thought to be a help to the process of grieving for both family and staff.

Death-Related Visions May Require Counseling

These experiences can precipitate a state of spiritual emergency. Patients who have had NDEs may have difficulty understanding what has happened to them. Divorce is not uncommon in adults after such experiences because patients reassess their life and goals. The experience may be frightening; in fact studies of negative NDEs suggest that the experiences themselves are similar to positive ones but that the patients misunderstand the experience as psychiatric pathology or interpret various elements of the experience, especially the dark void, as meaning that they are in hell or having a negative experience.[136]

In 10 years of counseling patients with these experiences, I have encountered the following common therapeutic dilemmas:

1. If NDEs involve a choice to return to life, does it then follow that if a child dies, he or she chose not to return? Parents often interpret this as meaning their child did not love them as much as those children who had NDEs (and returned).
2. If a child is in a prolonged coma, does this mean he or she is "stuck in the tunnel" or somehow unable or spiritually incompetent to complete the experience?
3. Why do some people have hellish or negative experiences? What about those who only experience a dark void or don't have any sort of spiritual experience at all?
4. Why do some family members have death-related visitations and others don't? For many families, death-related visions can lead to further family chaos because different value judgments and spiritual interpretations are placed on the experience.

These problems must be managed on a case-by-case basis. As belief in these experiences grows in the general population, such dilemmas will increasingly confront caregivers.

There is already a rich anecdotal literature on counseling adults who have had NDEs. Although no specific articles before this one have discussed counseling the child and family of a child who has had an NDE, the same principles apply.[188-193] Although children have a lower rate of complete recovery from cardiac arrest than adults (complete neurologic recovery is seen in 2% of cases in one series), it should be recognized that most clinicians will confront such a patient in their professional career.[194]

Recognize that critically ill and comatose patients are often aware of their surroundings and can hear and see through mechanisms not yet physiologically explained. The child should be spoken to as if conscious and all procedures explained to them. Parents should be encouraged to be at the bedside and speak to and touch the child.

As the child recovers, allow them the opportunity to express fears, anxieties, and to ask questions. Listen attentively to any reports. It is essential that any health care provider who works with dying patients be comfortable dealing with paranormal phenomena in an open and nonjudgmental fashion. Parents and family may be concerned about the mental state of children who have death-related visions. They should be reassured that such experiences are common, normal, and not the result of medications, high fevers, or pathologic brain conditions.

Avoid labeling either the death-related vision or the patient who has one. Give patients information about the experiences if asked, but remember that these experiences usually generate their own sense of meaning. Often the less said, the better, until the family and child have a chance to assign their own meaning to the experience. Simply listening to and validating the experience is most helpful in my experience.

Death-Related Visions Theoretically Can Assist in the Grieving Process

A common model for mourning involves four tasks: accepting the reality of the loss, working through the pain of grief, adjusting to a new environment without the deceased, and emotionally relocating the deceased and moving on with life.[195] The knowledge that it is scientifically respectable to understand death-related visions as representing a real event has enormous potential to facilitate normal grieving and theoretically impacts on each of these steps.

Death-related visions can affirm spiritual intuitions and faith. Death-related visions potentially can intervene at each of these steps if they are validated as meaningful experiences. Often these experiences

involve only a faint smile at the point of death or a brief comment such as "the light, the light," or "I'm on a rocket ship to the moon" and are not understood as being important.

Rando states that the establishment of meaning is essential to parents who are dealing with the death of a child. The child's death violates the natural order and can frequently cause a loss of faith in social conventions and spiritual beliefs.[166] Kalish[196] points out that the child's death causes more stress than any other death because is in not seen as inevitable, and there is exceptional social value placed on the life of a child. This often leads to greater social isolation and estrangement by grieving parents when confronted with the socially unacceptable death of their child.

Premonitions of death often involve only vague perceptions or feelings that nonetheless can reestablish faith in the order of the universe and that death has meaning. Postdeath visitations often involve dialogues with the dead, which anecdotally have been reported to facilitate grieving by allowing the loss to be accepted, as well as allowing the survivors to reinvest emotional energy.[79] NDEs have the power to restore meaning to the process of death because of their mythical role within our society. The study of premonitions in SIDS deaths clearly documented that parents who had premonitions of death felt that such premonitions restored meaning to their lives and the infant's death. This was the case whether the premonitions consisted of the perception of subtle physical signs, vague intuitions and feelings, or vividly real spiritual visions.

Death-Related Visions Potentially Can Decrease Pathologic Grief

It is generally accepted that pathologic grief often occurs from a misplaced sense of personal responsibility coupled with guilt over perceived violations of either personal or community standards.[166, 199] Magical thinking and irrational belief systems often fuel displaced anger and can lead to a failure of healthy grieving.[198] Death-related visions can restore a sense of order to the universe in that they often imply that there is a purpose and meaning to death, even if that meaning is obscure. A parent who interprets a child's death bed visions as hallucinatory ravings from drugs or physiologic derangement is seemingly less likely to look for meaning in the experiences than one who views such experiences within a communal and spiritual context that accepts such visions as natural. This can convert a senseless tragedy to one that has some sort of meaning.

If possible, family members should be encouraged to share their spiritual perceptions because often only after several family members relate a similar experience does it become validated and meaningful.[199] The knowledge that a child's dying experience was "real" and not a pathologic hallucination can help to restore parents' place within their community and reverse social isolation because they can share the experience with others without the social stigma that would be attached to a hallucination. The knowledge that the process of dying does not involve pain and that the child is at least thinking he or she is in a loving and secure place can bring enormous comfort to parents who might otherwise become obsessed with the seeming pain and dehumanization of medical technology often used in dying patients.

Death-Related Visions Can Prevent Professional Burnout

Dr. Frank Oski[200] recently reported a spiritual vision that he had after the death of one of his patients who died of a congenital defect. He stated that he had been deeply troubled by the children he was caring for who died from congenital disorders. A woman in white appeared at his bedside and informed him that such children often knew secrets concerning the meaning of life and that it challenges our humanity and ability to love when we care for such children. He concluded by stating that he believes it is spiritually nourishing to care for children who die and that he does not ask the medical community to believe his story but to simply keep an open mind to the many commonplace miracles of love and faith that we witness daily in caring for dying children.

Conversely, health care professionals often erect emotional barriers and resort to irrational routines and procedures designed to protect ourselves from experiencing the death of our patients. The brutality of modern medicine coupled with the use of painful and invasive procedures for dying patients has dehumanized the caretakers and results in spiritual despair and emotional burnout.[201] Spiritual visions of all kinds have the potential to reinterpret our approach to dying patients and to provide insight and spiritual nourishment for those fortunate enough to witness them. As our society grapples with the limitations of medical technology and euthanasia, it will become increasingly important for medical professionals to understand what the processes of dying involve so we can make informed decisions on issues such as assisted suicide that society is increasingly asking us to confront.[202-204]

Death-Related Visions Are Not Simply a Warm, Fuzzy Way to Die

Listening to and affirming death-related visions has the potential to dramatically reduce wasteful and irrational medical procedures and treatments. An enor-

mous percentage of our health care dollar is spent on intensive care unit management of dying patients without clear-cut benefit. It is my opinion that expensive and dehumanizing medical procedures are often used on dying patients without their consent and without any hope of prolonging life. We use these procedures to make ourselves feel that we have done everything possible to prevent death.

The medical profession often views death as a professional defeat. I have routinely treated hundreds of dying patients simply to normalize laboratory values, stabilize vital signs, increase or decrease urine output, or correct abnormal blood gases because I believed that I had to do everything possible even though meaningful life could not be achieved. I do not believe my personal experience is unique. Dr. William Knaus[205] of George Washington University School of Medicine has said: "In many cases, intrusive and complicated machinery is wheeled in to keep vital signs going, to give treatment of no benefit and tremendous cost, depriving others of treatment while dignity disappears."

Studies in adults show that dying patients primarily die in hospitals and that we spend 30% to 60% of our health care dollar on the last 3 months of life.[206-208] There is considerable debate in the adult medical literature over the cost-effectiveness and ethics of intensive care unit medicine, especially the routine use of cardiopulmonary resuscitation and assisted ventilation for dying patients.[209, 210] A similar debate has developed concerning the use of cardiopulmonary resuscitation for extremely premature infants, with one side advocating such treatment be labeled experimental, implying the need for informed consent as opposed to the routine use commonly seen in neonatal intensive care units.[211]

Studies of pediatric intensive care units suggest that such care is often not helpful or cost effective for the patients with prolonged intensive care unit stays.[212, 213] Some patients, such as bone marrow transplant patients who require ventilatory support, have a particularly poor outcome.[214] Unfortunately, many other conditions have variable outcomes, making prediction difficult. If it is your child who survives, then any amount of therapy and expense is often worthwhile, and many parents would opt for maximal care if there is any reasonable chance of survival.[215]

Dr. Susan Bratton, a pediatric intensivist at Seattle Children's Hospital, believes that often dying children are overtreated with intensive care unit technology, despite recent trends to send dying children home over the past few years. She believes that one problem is that physicians do not make decisions about when to use, apply, or withhold medical technology in critically ill patients and as a result, most patients receive all potential treatment as a matter of routine. She believes the reason for this is often a fear of litigation, coupled with a reluctance to accept the limitations of medical technology. Often such decisions are made by default by the most aggressive physician or family member in terms of prolonging life. It may be soon that third-party carriers will determine treatment decisions for patients and physicians based entirely on economic considerations (personal communication with Susan Bratton, MD, pediatric intensivist at Seattle Children's Hospital, December 9, 1993).

Spiritual visions carry with them an understanding that the process of dying can be joyous and spiritual and that death is not to be feared. I believe that in part our use of medical technology at the point of death reflects our own desire to control the processes of dying. I believe that our society has an exaggerated view of what medical technology can accomplish and that the cost of intensive care unit medical care, as well as the limitations of it in curing patients, is not well understood. If our society can understand that death is a part of life and not to be feared, we may see a withering away of overuse of medical technology and that many of the complex issues we are currently facing may spontaneously resolve themselves.

On the surface it may seem hard to perceive a connection between death-related visions and overuse of medical technology. Daniel Schuster,[216] of Washington University in St. Louis, believes the problem is that "we must learn to distinguish between everything that can be done and everything that should be done." He believes the problem is that we do not openly and accurately discuss the cost and outcome of critical care medicine with patients and believes the greatest cost is not in money but in human suffering. He believes that families should not expect that mechanical life support should be initiated in dying patients and asks: "Why did we get to this point, as physicians, as a society, where we can let—no actually be the cause of such suffering, and even do it in the name of patient autonomy?" He asks that physicians and patients enter into a tough, gut-wrenching, anxiety-provoking dialogue and accept our responsibility to start to make decisions instead of simply letting them occur by default.

I am not advocating euthanasia or physician-assisted suicide, both of which I am adamantly opposed to. I am not suggesting that we impose our religious beliefs on patients or give them an expectation that they have to have a death-related vision to die a good death. I do not believe that physicians and

nurses need play the roles of chaplains and social workers.

I am certainly emphasizing that these decisions need to be made on a case-by-case basis because nothing could be more difficult to predict than outcome in a pediatric intensive care unit.[217] I am saying we must avoid the unhealthy either full-bore treatment or "pull the plug" mentality and start to make real decisions based on individual circumstances. I am aware of several cases in which patients died "good deaths" because they were on ventilator support and the outcome for the child and family was better than if the child had died without technological intervention.

I believe that our society, as described by Pulitzer Prize winner, Ernest Becker,[218] is a death-denying society and that any discussion of taboo topics surrounding death is culturally difficult. Understanding that death-related visions may be as real as any other human experience and that a large portion of our brain is devoted to perceiving such experiences can radically change our societal perception of death. The spiritual aspects of death are clearly not taboo to discuss, so hopefully they will act as a cultural ice breaker and allow a reevaluation of our opinions and attitudes on a wide variety of death-related issues.

Paying attention to spiritual issues has an immediately practical effect as well. Paying attention to patient's feelings and spiritual beliefs can lead to significant savings, including shorter hospital stays and decreased use of pain medications.[219] Spiritual care is documented to reduce costs and unnecessary procedures.[220] We often do not spend enough time simply listening to and touching patients, relying on expensive medical tests that are easier to document and justify although ultimately leading to more expensive care.

Death-related visions are a natural part of the human response to death and are not pathologic hallucinations or psychiatric fantasies. They are a coherent spectrum of events that cannot be understood in isolation. It is only necessary for us to honor the basic principles of medical care, to listen to patients and validate their feelings and intuitions. The experiences have the power to heal, not only our patients but also our society, which is grappling with the limitations of medical technology and our cultural denial of the reality of death.

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