

# Science and Spirituality: A Challenge for the 21<sup>st</sup> Century [The Bruce Greyson Lecture from the International Association for Near-Death Studies 2004 Annual Conference]

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**ABSTRACT:** Spirituality is increasingly acknowledged in medicine as a legitimate topic of instruction and focus of research. I highlight some findings of my own and others' retrospective research on near-death experiences (NDEs), review recent prospective research by myself and others, and describe veridical perception research I plan to undertake. After reviewing findings regarding approaching-death experiences and their relationship to NDEs, I assert my current perspective on the relationship between mind and brain and explain the impact that empirical support for that perspective will have on both science and humanity.

**KEY WORDS:** near-death experience; out-of-body experience; cardiac arrest; deathbed visions; mind-brain relationship.

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This paper was transcribed and edited from Dr. Fenwick's Bruce Greyson Lecture at the 2004 annual conference of the International Association for Near-Death Studies by Janice Miner Holden, Ed.D., Professor in, and Coordinator of, the counseling program at the University of North Texas in Denton. Dr. Holden's primary area of research interest is the transpersonal perspective in counseling, in general, and near-death and similar experiences – their veridicality and their role in personal and transpersonal development – in particular. She currently serves as president of the International Association for Near-Death Studies.

A major and relatively rapid shift is underway in the field of medicine. In the past 10 years, medical professionals have gone from looking upon spirituality with a skeptical if not cynical eye, to embracing it enthusiastically. Consider these developments:

- The number of American medical schools teaching courses on spirituality in medicine was only three in 1995, but grew to 40 by 1998, and reached 100 in 2001. The new generation of doctors that are now qualifying has had spirituality ingrained at an early stage in their medical training.
- In 1997, Harvard University held a conference on prayer. Since then, researchers have conducted a number of double blind, randomized, controlled trials on prayer, and some of these studies indicated that prayer works. The role of prayer in medicine is beginning to be taken so seriously that, in a recent issue of one of the major journals of cardiology, an author raised the question of whether every hospital in this country and in the United Kingdom should have prayer groups for patients in hospital. Such a suggestion would have been unthinkable 10 years ago.
- In 1999, the British Psychological Society, the main academic psychological institution in the U.K., started a section on transpersonal (spiritual) psychology. And in the year 2000, a number of us were able to persuade the Royal College of Psychiatrists to bring in a special interest group in spiritual psychiatry. That group has been growing the fastest of any special interest group: 800 psychiatrists in the U.K. have joined the section in less than four years.
- In 2000, Oxford University Press published the *Handbook of Religion and Health*. In it, authors Harold Koenig, Michael McCullough, and David Larson have brought together into one volume all the research on spiritual medicine. All of you who are caregivers or doctors should have it on your shelf, or urge your libraries to acquire it.
- And to make a point that I have already mentioned, double blind, randomized, controlled trials on many aspects of spiritual medicine are now being conducted. The role of spirituality in medicine has become a legitimate and frequent subject of empirical research. A book by Daniel Benor, *Spiritual Healing: Scientific Validation of a Healing Revolution. Professional Supplement* (Vision Publications 2002) is an excellent reference volume.

Things have changed for the better regarding serious inquiry into, and acceptance of, the role of spirituality in medicine. But they still have further to go. Today I would like to talk about two sets of experiences: approaching-death experiences that occur in the 24 hours before death, and the dying process itself, for which I am going to use the near-death experience (NDE) as a model. I am going to begin my talk with near-death experiences. First, I will discuss the early retrospective studies, those that involved researchers collecting accounts from experiencers whom they met for the first time after the participants had already had their NDEs, and about whom they had no information. I will address only those aspects of these studies that particularly interest me. Then, I will talk about the current focus of near-death research: prospective studies, those in which the researcher begins studying the participants before they have their NDEs, and thus has information about the circumstances in which the near-death experience occurs.

### **Retrospective Studies on NDEs**

What has been learned from the retrospective studies? We learned about the phenomena of NDEs. We learned how often they occur: in about 10 percent of people who come close to death or who survive actual clinical death. We learned a little bit about the circumstances, and, most important, we learned about cultural differences, which are huge.

I want to mention a survey which my wife and I did in 1987 and published in our book, *The Truth in the Light* (Fenwick and Fenwick, 1996). The study followed a television program – the first in the U.K. on the topic of NDEs – after which we received 2,000 letters. The majority of the letters said, “Thank you so much for the program, because I have never been able to talk about near-death experiences before, and now I can, for the first time, actually discuss my experience with people.” It was a landmark.

Of those letters, we took 500 which we thought described core NDEs: what Kenneth Ring (1980) defined as including the subjective sense of being dead; a feeling of peace, painlessness, pleasantness; a sense of separation from the body; a sense of entering a dark region; encountering a presence/hearing a voice; taking stock of one’s life; seeing, or being enveloped in, light; seeing beautiful colors; entering into the light; and/or encountering visible “spirits.” We sent those 500

a questionnaire, and had 450 replies. Now, we can never find this sort of sample again, because 98 percent of those people knew nothing about NDEs, they had no preconceived ideas about them, and were simply describing exactly what they had experienced. The knowledge that people now have about the NDE has so changed the expectations of people that it is now difficult to say whether people's accounts are what they expect would happen or what actually did happen. So this is now a disadvantage as regards retrospective research: public knowledge of NDEs has inextricably contaminated our research participant pool. So our sample will remain an important one.

Among those 450 participants, 76 percent were women. Does this finding mean that women are really spiritual and that men have a long way to go? No, I do not think so. I think it is simply that women are much better letter writers than men. The age distribution of those who experienced NDEs was interesting: there were equal numbers in each decade. In other words, the number of people who reported having had their NDE sometime in their first decade of life, age 0–10, was very similar to those who reported having it in their second decade, and so forth. So our findings indicate that there is no privileged age range for having an NDE.

The religious affiliation of our respondents was 54 percent Church of England, 12 percent Roman Catholic, 19 percent other Christian, 1 percent Jewish, 8 percent Agnostic, and 2 percent Atheist, with 41 percent of respondents indicating that religion was not important. This profile of religious affiliation is quite similar to the overall English religious profile, so we were able to say that religious belief at the time of the NDE played no part in it. Indeed, some of the atheist respondents wrote some really cross letters saying that they had not wanted this experience and they found it quite difficult to incorporate into their lives.

The multiplicity of circumstances of our respondents' NDEs was interesting, and it was the varied nature of the circumstances in which the NDE occurred that led me to the belief that we have to be very, very focused in our research if we are going to find proper answers. Thirty-seven percent of our respondents reportedly were receiving drugs at the time of their NDEs, and 63 percent were not. So the theory that NDEs are all drug induced could not be correct. About two thirds had their NDEs during illness, operations, childbirth, or accidents. Two percent occurred in suicide attempts and 20 percent in other circumstances that included anxiety states, dreams, relaxation states, or quite spontaneously in the normal course of life.

Now, it is impossible to postulate the same mechanism for all of those very diverse states. If you are going to do any worthwhile NDE research, you have to target a specific group of people who, as far as possible, have their NDE in similar circumstances and under similar conditions. Fortunately, nine percent of NDEs were said to have occurred during a heart attack, and that is hopeful from a research standpoint, because most people during a heart attack have the same physiological state, which will allow some conclusions to be drawn about those who do or do not have NDEs.

The phenomena reported during NDEs included 66 percent who reported an out-of-body experience, 76 percent pastoral landscapes, 38 percent seeing deceased friends and relatives, 12 percent life reviews, 24 percent a barrier of some sort, and 72 percent a decision to return. Only 4 percent had hellish experiences. Why so few? Understandably, someone might be reluctant to write a letter to a perfect stranger saying, "There I was in this pit with sulfurous smoke and devils poking me." So that reluctance might account for the low report rate. But in light of all the research we have done, I feel that distressing experiences are, in fact, quite different, and truly occur much less frequently, than the pleasurable NDEs. They have a strong confusional component seen much less often in the positive NDEs.

I was particularly interested in the pastoral landscapes, because they are also reported by terminally ill patients in approaching-death experiences. The landscapes have always been described as very beautiful, and usually include wonderful flowers. We had one or two botanists among our respondents, and they said that the colors were most exciting, but, interestingly, that they saw no new species, only species they already knew. Of course, the main focus of the respondents was the incredible beauty of all those vibrant colors.

I was interested to know whether there were any spiders, gnats, snakes – anything that bites. We found nothing; none was reported. And what about other animals? Our respondents did report animals, but only very seldom, and only dogs. One man saw all the dogs of his life come bounding over the hill towards him. So all in all, it was a very pleasurable experience to be in this land, and if the many NDErs who assert that we all will have this experience at death are correct, our data indicate that it is not going to be awful. You will be able to stroll around the garden, and you will not have to worry about what's going to bite you.

I was also particularly interested in the heavenly music and wonderful birdsong reported by some of our participants, because of my interest in how the brain works with music. Our respondents

reported mainly concordant music, strong emotional music. At that time, neuroscientists thought that music was mainly a phenomenon involving the right hemisphere of the brain; since then, the neuroscience of music has progressed and indicates that the whole brain is involved in music. Nevertheless, the strong emotional quality of this music indicated a strong involvement of the right hemisphere.

Whom did our respondents meet in their NDEs? Well, this seemed to be culturally determined. In the West, we mostly meet dead relatives and occasional strangers who always behave toward the NDEr in a welcoming way. Now, here is an interesting thing that we found also in the approaching-death experiences: The dead tend to be seen in the prime of life, even though they may have died ill or damaged by accidents or in ripe old age. All injuries had been healed. We were told of a lovely near-death experience by a man who had had meningitis. Jesus came into his third-floor room by the window, took him by the hand, and walked with him out of the window, straight into this lovely landscape, and, coming from all directions, there were people who were taking off bandages, dropping their crutches, and being healed by the process of going toward the garden and the light. Some of our respondents reported meeting people whom they did not know were dead, but who were later confirmed to have been dead at the time of the NDE. It was usually the relatives they met, though sometimes it was the Being of Light, who sent the NDErs back to earthly life.

Another phenomenon that particularly interested me was the tunnel. Why a tunnel? I told you about the experience involving Jesus: it was a lovely day, and they went out through the window, which seems logical. But another of our respondents had an out-of-body experience, again on a beautiful day outside. She went up to the ceiling, and knew she was *going* to go through the window – but she did not. Instead, a tunnel opened up in the ceiling, and she went through the tunnel. We all know Hieronymous Bosch's painting as the prototypical NDE tunnel, but in our study very different kinds of tunnels were described. The commonest one was a void, a blackness: a floating, a moving, a going towards the light. The structure of the tunnel, if anything, was minimal. One person had a "tunnelly tunnel," like one of those great big pipes that leads the hot air away from a clothes dryer. Other people had swirling, whirling tunnels, but they themselves did not turn; the tunnel simply turned around them, while they themselves floated through it.

The data available suggest that NDE phenomena are described differently in different cultures. Tunnels, for example, seem to be a particularly Western feature. Take, for example, the journey from

this dimension to an otherworldly dimension. Japanese NDErs do not report tunnels. Instead, they have caves. People will walk towards a cave, which will be the entrance to the new reality. Quite often, they report having come up to a dark river where there was a boatman. This feature is absolutely inherent in their culture. Among hunter-gathers, the transitional journey most often involved a river. They reported going on journeys, most commonly by getting into a boat and paddling for three days before arriving at an otherworldly area.

How many of you NDErs in the audience had a journey back? A couple of you had journeys back, but it is unusual. None of the participants in our study described such a journey; usually they say they just “snapped back” into their body. Why? Why do NDErs so rarely report a journey back?

And then, of course, there is transformation. Particularly notable was the finding that 72 percent of our respondents reported being more spiritual and having less fear of dying. Some findings from other studies provide some very interesting things to think about. For example, in Bruce Greyson’s (2003b) study of 272 patients who had a brush with death, 22 percent had NDEs, and they were found to be less psychologically disturbed than those who did not have NDEs. So that is extremely good news in that it goes against the idea that those who have NDEs have some mental pathology.

Willoughby Britton and Richard Bootzin’s 2004 study is interesting, but unfortunately the data set is too limited to draw any conclusions. They suggested that near-death experiences are a manifestation of temporal lobe epilepsy. This suggestion has been made on previous occasions by other authors, and it is always made by those who do not deal with epilepsy on a daily basis and who do not have a comprehensive understanding of the features of an epileptic seizure. No epileptic seizure has the clarity and narrative style of an NDE. And this is because *all* epilepsy is confusional. Epileptologists all agree that one thing that near-death experiences are *not* is temporal lobe epilepsy. Britton and Bootzin’s paper is, I think, going to bias the near-death literature in a way that is quite unjustified by the data of the study.

However, within that study there were some interesting points. They had 23 NDErs and 20 controls, so the numbers are small, but the NDErs scored more highly on a scale of their ability to cope. They were better, active copers; they were able to plan; they had positive reinterpretations of their experiences, and they had positive growth. There were no differences in posttraumatic stress scores with the control group. The study is important in that it suggested that NDErs have good coping strategies.

Greyson (1986) found that 26 percent of a group of patients who attempted suicide had NDEs. Of the people who wrote in to us, only 2 percent had their NDEs during suicide attempts. Greyson (1981, 1991, 1992–93) has published additional studies on suicide attempters who had NDEs, finding that their likelihood of attempting suicide again was dramatically lower, compared to nonNDE suicide attempters. But if any of you want a Ph.D. topic, this is an area on which we still need more data. I had one patient who after her NDE wanted to get back to the experience so badly that she always carried a ligature around with her; she was in the hospital a year before we managed to get her better. She would take any chance she could to put the cord around her neck and hang herself. But that is very unusual. I would like to know more about the effect of an NDE on future suicidal behavior.

That is all I want to say about retrospective studies, so let me turn now to the cutting edge of NDE research. This is a new and very exciting developing area: prospective studies. Just to remind you, these are studies in which the researcher begins studying the participants before they have their NDEs, and thus has information about the circumstances in which the near-death experience occurs and can start to ask focused scientific questions about it.

### **Prospective Studies of NDEs**

Now, none of you will know this study because it is not published yet. It is a new prospective study from the U.K., conducted by Dan Shears at Guy's Hospital. He was the doctor on the meningitis ward and questioned the 90 percent of children who had recovered from meningitis. What he found was very similar to Melvin Morse's retrospective findings (Morse and Perry, 1990), but, again, Shears' study was prospective, so he knew the medical condition of the children involved. Of the children he questioned, one, a 3½-year-old boy, three months after the meningococcal disease, said that when he had been ill, "Two angels took me: a big angel and a boy angel." He met with his grandfather and played with toys and other children, and "then the angels brought me back." It was a lovely, simple, experience – and his grandfather had died nine days after the child had been admitted to the hospital, which is interesting.

Another 4-year-old boy, two weeks after his discharge from hospital, reported, "A man with wings came to see me while I was in hospital. I could see him out of the corner of my eye." He went on to describe an



out-of-body experience. He recalled his still-living grandmother talking to him at his bedside, and he could not tell her to shut up, as he was “asleep.” So he was outside himself and watching. He was also adamant that his grandmother knew who this winged man was, but I do not think she did; I do not think she could see him.

A 7-year-old girl described having an experience in the pediatric intensive care unit of St. Mary’s Hospital. She described feeling very calm and peaceful, clearly the beginnings of a near-death experience. She was observing herself from the end of the bed, and, again, she was standing next to a boy whom she did not know.

I have a videotaped account for you, which I will play now. The child is 3 years old and has reflex anoxic seizures in which her heart stops. During the time that she is unconscious she has out-of-body experiences. Here she is describing how, in one of these episodes, she goes up to the ceiling and then watches her mother do the resuscitation process “all wrong”:

Narrator: Most of us have preconceived ideas about such experiences, but this little girl was barely 3 years old when she described an out-of-body experience to her mother.

Mother: She was telling me that she goes, and she goes up, and she’s watching herself. Now, I did find it amazing. I was speechless.

Narrator: She suffers from a rare illness called reflex anoxic seizures, which temporarily stop her heart beating. In her short life, she has clinically died over 20 times.

Mother: She has no vital signs; she has no respiration, no pulse, no heartbeat, no anything. She turns from a blue to an ashen, and black, I would say, lips.

Narrator: Fortunately, she normally recovers from a seizure within a minute, but as she grew older, she began to talk to her mother about them.

Mother: She watches herself, and then, she tells me, again, her words, she “clicks” back in.

Narrator: On one occasion, she collapsed in her mother’s bedroom. Her mother placed her in the recovery position and soothed her. When the child “came round,” she was furious with her mother for not

placing her on the floor as they'd been taught by the doctor.

Mother: But when she came back, I mean, she had told me what I had done and how I did it wrong and what I'd said.

Narrator to child: Where do you go?

Child: Up in the ceiling.

Narrator: Up in the ceiling! Can you tell me what it's like?

Child: I see Mommy helping me.

There are good reasons for studying childhood NDEs. Very few children will have been exposed to the idea of NDEs. Young children especially have a poorly formed view of the idea and permanence of death. Children whose parents have no religious views or convictions are even less likely to have been told about what to expect at death. In his 1989 paper, Harvey Irwin suggested that children who had had no religious instruction would be ideal to test the sociocultural conditioning hypothesis against the paranormal-spiritual hypothesis. In other words, if kids who do not know about NDEs have an NDE, you cannot explain it by saying they have learnt about it as a cultural experience.

### *Our Study of Cardiac Arrest Survivors' NDEs*

The first published prospective study that included cardiac arrest patients, Michael Sabom's 1982 study, also included patients who had been in other near-death circumstances, such as severe traumatic injury or comas from metabolic disorders or systemic illness, and also included patients whose arrests had occurred both in and out of hospital. To my knowledge, the first published prospective study focusing entirely on cardiac arrests that occurred in the hospital was the one that Sam Parnia and I did at Southampton University (Parnia, Waller, Yeates, and Fenwick, 2001). We wanted to ask two questions about near-death experiences. Firstly, would people who had had cardiac arrests report having NDEs at the time of their arrest? That is, our first question was whether NDEs would be found in our prospective study. The second question was: Do these experiences occur before unconsciousness, during unconsciousness, during recovery, or after recovery?

Those questions were absolutely crucial. They were not only crucial for NDE research, but they were also crucial for neuroscience as a whole, because neuroscience has come up against a block. The

problem is that neuroscientists do not know what consciousness is and have no theories to explain its nature. That is because our science is the science of the external world, a hangover from the time of the Renaissance, and it does not deal with subjective experience, or with consciousness. This is the main problem facing neuroscience at the moment, and it may well be that NDE research will be one way of filling the “consciousness gap” in neuroscience.

So what did we do? We studied cardiac arrest survivors over the age of 18. To qualify for our study, when questioned after their cardiac arrest they had to be lucid, not confused; they had to agree to be interviewed; and their medical team had to allow us to ask them questions. Of course, we used Greyson’s (1983) NDE Scale; there isn’t a better instrument for assessing the presence or absence and the depth of an NDE.

What did we find? We found prototypical NDEs: feelings of peace and joy, sense of harmony, bright lights, heightened senses, encounters with mystical beings, encountering barriers of no return, and so on. Out of a base group of about 220 people who were admitted to the unit after a cardiac arrest, only 63 people survived. Of those 63 survivors, 56 (89 percent) had no memories during their arrest; and 7 (11 percent) had memories. Of these latter 7, four (6.3 percent) met the Greyson criteria for an NDE, and the other two, although not meeting the Greyson criteria, did have NDE features which made us put them in the NDE group. So our rate is about 10 percent, so one can generalize to cardiac arrest as a whole and say that about 10 percent of survivors of cardiac arrest will report NDEs.

Our conclusions from the study were that cardiac arrest NDEs were classical; rates were similar to previous estimates; and patients said that the experiences occurred during unconsciousness. Now, that is important because neuroscience maintains that conscious experience is not possible during physical unconsciousness. We also found that NDEs were not due to medication, electrolytes, or blood gases. So something interesting is going on.

### *Other Recent Prospective Cardiac Arrest NDE Studies*

There are now four recent prospective cardiac arrest NDE studies. There is ours in 2000, and we found an incidence of about 10 percent NDEs among survivors (Parnia, Waller, Yeates, and Fenwick, 2001). Pim van Lommel and his Dutch colleagues in 2001 found about 12% percent (van Lommel, van Wees, Meyers, and Elfferich, 2001). In

Janet Schwaninger's American study published in 2002, a higher rate of 23 percent was found (Schwaninger, Eisenberg, Schechtman, and Weiss, 2002). Greyson, in his study about a year later (2003a), found 10 percent. And one of my Ph.D. students, Penny Sartori, in an unpublished study, found about 25 percent. So, you can say that of people who will have heart attacks, between 10 and 20 percent will have NDEs, and I doubt those figures are going to change very much.

So you can calculate straight away that over one million Americans have stood in the light: very powerful. Think of all those people who have experienced an altered state of consciousness. The world is changing. But not only that: more defibrillators and pacemakers are being implanted into hearts, and as the heart quite often stops in this process, this means that even more people are going to have NDEs and their aftereffects.

I want now particularly to mention van Lommel's Dutch study (van Lommel, van Wees, Meyers, and Elfferich, 2001). This was a huge study, with 344 cardiac arrest survivors in 10 hospitals. Forty-one survivors reported NDEs. The occurrence of NDEs was not influenced by the duration of either unconsciousness or cardiac arrest, or by medication. So that is really interesting: you do not have to be unconscious for long, but there may be a critical limit; we do not know. More NDEs were reported in the group of survivors who actually died shortly after their experience, so it looks as though the closer you are to death, the more likely you are to get an NDE.

This study also had an 8-year follow up, the longest follow up that has ever been published. It enabled the researchers to ask, first, whether the memory of an NDE changes across time, and second, what happens to people who do not have NDEs: do they have any of the change in personality that NDErs show? If you look at Table 1, you can see straightaway that, in fact, there are interesting changes after a cardiac arrest even amongst the people who did not have an NDE. Positive scores indicate an increase in the personality changes, and the larger the number, the larger the increase overall for that group. Negative numbers indicate a decrease in the personality changes, and the larger the number, the larger the decrease.

I just want you to look closely at this table. Do you see those changes in the *nonNDErs*? The changes are greater overall in the NDErs, certainly. But I want you to understand that not only NDErs change, because a heart attack in itself is a very powerful, important event, and here is clear evidence that people who have heart attacks change, whether or not they report having had an NDE. Note that after eight

**Table 1**  
**Changes in cardiac arrest survivors at 2-year and 8-year follow-up (from van Lommel, van Wees, Meyers, Elfferich, 2001)**

<i>Life Change Inventory Item</i>	<i>2-year follow-up</i>		<i>8-year follow-up</i>	
	<i>NDE</i> ( <i>n</i> =23)	<i>no NDE</i> ( <i>n</i> =15)	<i>NDE</i> ( <i>n</i> =23)	<i>no NDE</i> ( <i>n</i> =15)
<b>Social attitude</b>				
Showing own feelings	42	16	78	58
Acceptance of others	42	16	78	41
More loving, empathic	52	25	68	50
Understanding others	36	8	73	75
Involvement in family	47	33	78	58
<b>Religious attitude</b>				
Understand purpose of life	52	33	57	66
Sense inner meaning in life	52	25	57	25
Interest in spirituality	15	-8	42	-41
<b>Attitude to death</b>				
Fear of death	-47	-16	-63	-41
Belief in life after death	36	16	42	16
<b>Other</b>				
Interest in meaning of life	52	33	89	66
Understanding oneself	58	8	63	58
Appreciation of ordinary things	78	41	84	50

years, the nonNDEs scored higher than the NDEs on understanding the purpose of life! So, having a heart attack in itself is significant. NDEs became less fearful of death after their NDEs, but so did nonNDEs. So one thing that has been learnt from this study is that even people who do not have an NDE may have their consciousness changed just by the fact that they have had a heart attack. Interestingly, spirituality *decreased* in nonNDEs after their heart attacks but increased in the NDEs.

Moving on to the Schwaninger study, 30 cardiac arrest survivors were interviewed over three years (Schwaninger, Eisenberg, Schechtman, and Weiss, 2002). Twenty-three percent had NDEs, all of which were pleasurable; there were no "negative" NDEs. She found no

difference in demographic variables, so, again, there is nothing special about people who get NDEs. How people interpreted their NDEs, however, was, as we know, based on personal, cultural, and religious views. An interesting point was that they needed psychosocial support before hospital discharge. And at 6-month follow-up – not as long as van Lommel's, but the results show the same trend – spiritual and religious views changed, as did attitudes towards others, personal understanding, and social customs.

Greyson's (2003a) American study was of 1,595 patients admitted to a cardiac care unit with heart trouble. He found an incidence of 10 percent NDEs among cardiac arrest survivors and found that the more severe the illness, the more likely the survivor was to report an NDE. And what he said is this: "The paradoxical occurrence of heightened, lucid awareness and logical thought processes during a period of impaired cerebral perfusion [absence of blood flow to the brain] raises particularly perplexing questions for our current understanding of consciousness and its relation to brain function" (p. 275). So that is now in the literature. And based on that, Sam Parnia and I have a paper being reviewed for *Neuroscience Letters* in which we propose the experiment which I am going to show you. Whether or not they will publish it, I do not yet know.

An important finding from Greyson's study was that patients admitted to intensive care *without* coronary arrest reported NDEs 10 times *less* often than coronary arrest patients, and the non-arrest NDEs contained fewer sensations of the light, less enhanced cognitive function during the experience, and less positive emotion. Now, my Ph.D. student, an intensive care nurse, has done a study – again, it is not published – and the rates she found for NDEs in an intensive care unit were almost the same as Greyson's. So, if you go to any intensive care unit, 1 percent of non-arrest patients have NDEs and 10 percent of people with cardiac arrest.

### **Attempts to Understand Cardiac Arrest NDEs**

So, now we come to the really important question: what happens when an NDE occurs during a cardiac arrest, and why is this important?

The first point is that signs of cardiac arrest are the same as clinical death. There is no detectable cardiac output, no respiratory effort, and brainstem reflexes are absent. If you are in this state and I put a tube

down your throat, you will not cough. You will have dilated pupils. Your blood pressure has fallen to zero. You are, in fact, clinically dead. Even if I start cardiopulmonary resuscitation (CPR), I cannot get your blood pressure any higher than 30 millimeters of mercury, and this is not going to produce an adequate blood flow to your brain.

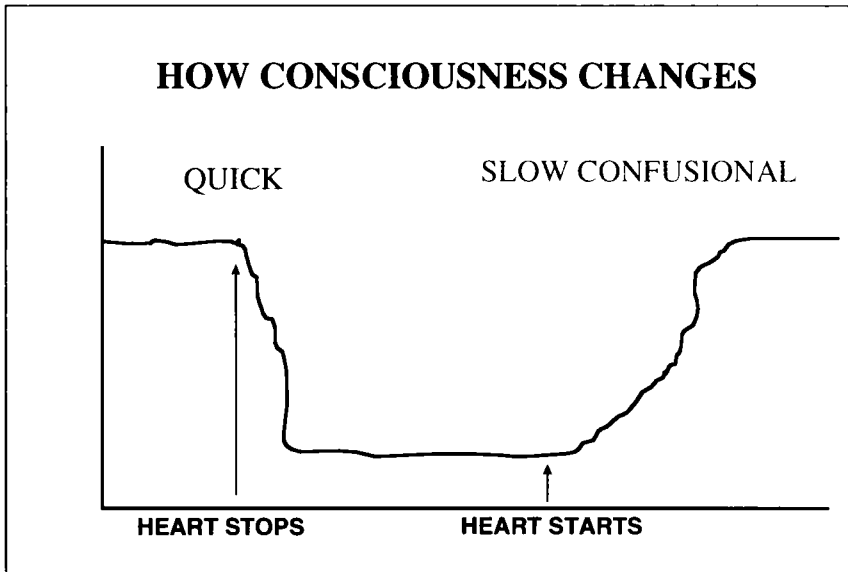
A number of studies show that the longer CPR is continued, the more brain damage occurs. So it is not an ideal intervention. We know that after a cardiac arrest, both NDErs and nonNDErs suffer brain damage, but we do not know whether the amount of brain damage in the two groups is the same or different. During CPR, you are not going to be able to perfuse – that is, force an adequate amount of blood through – the brain. When the heart does finally start, the blood pressure rises, and there is a slow resumption of circulation and lots of technical reasons why your brain function does not return instantly. And the point to remember is that your mental state during recovery is confusional.

What should be clear to you now is that it is not a good thing to have a heart attack. In their 1999 study of cardiac arrest and brain damage, Graham Nichol and his colleagues found that out of 1,748 cardiac arrests patients, only 126 survived (Nichol, Stiell, Hebert, Wells, Vandemheen, and Laupacis, 1999). Most units range between 2 and 20 percent resuscitation rates. Eighty-six of Nichol's survivors were interviewed, and most of the people who were resuscitated had evidence of brain damage.

Simultaneous recording of heart rate and brain output show that within 11 seconds of the heart stopping, the brainwaves go flat. Now, if you read the literature on this, some skeptical people claim that in this state there is still brain activity, but, in fact, the data are against this in both animals and humans. The brain is not functioning, and you are not going to get your electrical activity back again until the heart restarts.

The flat electroencephalogram (EEG), indicating no brain activity during cardiac arrest, and the high incidence of brain damage afterwards both point to the conclusion that the unconsciousness in cardiac arrest is total. You cannot argue that there are “bits” of the brain that are functioning; there are not. There is a confusional onset and offset, and there is no brain-based memory functioning. Everything that constructs our world for us is, in fact, “down.” There is no possibility of the brain creating any images. Memory is not functioning during this time, so it should be impossible to have clearly structured and lucid experiences, and because of brain damage, memory should be significantly impaired, and you should not be able

**Figure 1**  
**Changes in consciousness during cardiac arrest.**



to remember any experiences which occurred during that time. Now, that raises interesting and difficult questions for us, because the NDErs say that their experiences occur during unconsciousness, and science maintains that this is not possible.

Figure 1 is an illustration I have drawn that I hope is helpful. The height of the line above the x axis shows the intensity of consciousness, and the squiggly line represents the level of consciousness. When the heart stops, the line starts to dip, and consciousness is lost. So you are going along conscious, your heart stops, and there is a very quick descent into unconsciousness. Those of you who have ever fainted will agree that when you faint you lose consciousness very quickly. So you lose consciousness, then you are unconscious, and then the heart restarts, so science says the NDE cannot occur while you are unconsciousness; that is the pink area in the diagram. Now, as you slowly regain consciousness, the slow recovery is all confusional, so the NDE cannot occur there.

So then, as far as science is concerned, the NDE cannot occur at the point the heart stops, it cannot occur at any point during the period of unconsciousness, and it is unlikely to occur at the point of confusional



arousal, because it is not typical of that level of consciousness; and if it occurred after recovery, the NDErs would say it occurred after recovery, because they know they have recovered. So there are real difficulties in accepting that the NDE happens when the NDErs say it happens: during unconsciousness. So are you beginning to feel the significance of the timing of the NDE both for neuroscience as well as for our understanding of the NDE?

One of the major models we have of the NDE at the moment is the ketamine model. During cerebral anoxia, when the heart stops and there is no oxygen supply to the brain, there is widespread release of a chemical called glutamate, an NMDA agonist which leads to high nerve cell stimulation rates and chaotic firing in the brain. Ketamine is an anesthetic drug that acts like glutamate and is sometimes used as a street drug because of its pleasant subjective effects. Experimentally, ketamine leads to some NDE phenomena. Evgeny Krupitzky and Alexander Grinenko (1997) used ketamine in psychotherapy with alcoholics and found that it resulted in the same sorts of changes that people have with NDEs. Their patients became more social, more creative; more concerned with self-perfection and with achievement in life; more spiritually content; more interested in family, education, and social values; and more individually independent – many of the changes that NDErs have. Does that mean that the experiences are the same? Is it the NMDA stimulation that produces the NDE?

Well, look at this example of a ketamine experience, taken from Karl Jansen's 2001 book, *Ketamine*:

... I found myself as a bodiless point of awareness and energy floating in the midst of a vast vaulted chamber. There was a sense of presence all around, as though I was surrounded by millions of others, although no one else could be seen. In the center of the chamber was a huge, pulsing, krishna-blue mass of seething energy that was shaped in a geometric, mandalic form . . . . Then suddenly, I was back in my body, lying on my bed. "Wow," I thought, "it's over. How abrupt!" I tried to sit up. Suddenly, my body was gone again and the room dissolved into blackness of the void, my reality being quickly pulled out from underneath my feet, like a hyperspatial magician's tablecloth trick. (p. 243)

NDErs, is that like your experience? No, it is not. There are some similar features, but there are other features that are very different.

So although the ketamine model is the best scientific candidate so far to account for the NDE in cardiac arrest, it cannot explain every feature of NDEs. And I am not sure that even if we say that the NDE is

a ketamine-like experience, we can, in fact, completely understand the whole of the NDE during cardiac arrest. Because we are left with the problem of exactly when does the NDE occur? And the only way you can get an answer to this is through out-of-body experiences (OBEs).

### **Focusing In On the Near-Death Out-of-Body Experience**

Anecdotal evidence suggests that the OBE, and so the NDE, occurs during unconsciousness. There is also anecdotal evidence that it may be veridical. Sabom in 1982 found that some of his research participants gave correct accounts of resuscitation procedures, suggesting that the NDE occurs when the brain is “down.” The case of Pamela Reynolds, for those of you who saw the BBC production *The Day I Died* (Broome, 2003) or read the account of her case in Sabom’s later book (1998), is also suggestive of that. And, of course, Kenneth Ring and Sharon Cooper (1997) have described cases of NDEs in blind people who claim to have what they call “mindsight” and are able to “see” the resuscitation room. So, is the OBE truly veridical? That is, does it consist of verifiably accurate perceptions that would have been impossible to perceive from the vantage point of that person’s physical body? This is the cutting edge question in NDE research. So, let us have a look at that. I will just play you this video of one of the people from our study who had a heart attack and an out-of-body experience.

**Narrator:** In a respectable London suburb near Hampton Court lives a man who has twice been at death’s door and survived to tell the tale. Derrick Scull, age 66, is married with two children. He’s a retired Army major who now works in a large firm of lawyers.

**Scull:** Well, basically, I pride myself in being a fairly pragmatic, down-to-earth sort of person, but the experience that I underwent in 1978 remains etched in my memory for the last 8 years, and certainly I couldn’t believe my eyes or my senses at the particular time. I had a heart attack, and I found myself in hospital in the intensive care unit on the first day. The hospital medical staff had done everything they could for me. I was lying there in an operation robe with a mask on my face, and obviously I’d received an injection of morphine or some sort of drug to keep me under control. I wasn’t experiencing pain; in fact, I was feeling at peace with the world.

And suddenly, I seemed to take off and float, airborne, I suppose one would describe the word, into the corner of the room where I was able to look back, and I was conscious of lying there, and there was my own body, and I thought, "Good gracious, what is this?" In fact, I sort of, if I can describe it, I was looking at my toes on the ceiling, sort of looking over, and there was my body immediately below me. I was in the corner, left hand corner of the room, looking down on this body, and I had a perfectly good eye view of the bed and the entrance to the ward. And then I was also suddenly conscious that outside the room, there was my wife standing there in a red trouser suit talking to a nurse. I thought, "My God, what an inappropriate time to arrive. I'm up here, and there's the body, and what's going to happen?" I thought, "Something must happen."

But the very next thing I was conscious of was, sitting beside me was my wife wearing a bright red trouser suit. And I was there. I'd come down from the ceiling somehow, and there she was. This is why I know it wasn't a figment of my imagination, because it was so clear. I've given you the illustration of exactly what my wife was wearing, that was a red trouser suit, and I couldn't have seen her at the time. So this absolutely convinced me, and it was certainly cemented after my second heart attack when I went through a totally similar experience, and I am absolutely converted to this theory that something – call it your soul, call it whatever you like – does, in fact, temporally detach itself from your body, goes to a vantage point, and looks back and reviews the situation. And that's exactly what I felt I did on both occasions.

Now, Major Scull is very clear that his OBE happened during his cardiac arrest. What we need to do is to test this. Sartori, from Morrilton hospital in the U.K., did this in a study for her Ph.D. thesis, not yet published. Using a method suggested by Janice Holden (Holden, 1988; Holden and Joesten, 1990), Sartori put randomized cards on top of the monitors displaying the patient's medical data, which are always present in patient rooms, usually beside the bed. Because the monitors were above eye level of a person standing up, the cards on top of them could not normally be seen by the nurses.

The question is, of course, when people left their bodies, did they see the cards? What would you guess? What are you NDErs going to look at when you leave your bodies? Are you going to look around the room, have a look at the monitors, see if there are any cards hidden there? You are not going to be interested in impersonal cards. The only thing you are interested in is this thing lying on the bed, which is your body, and nothing else. And that is exactly what happened in Sartori's study. I had thought that people would see the cards, but they did not. Sartori has now had eight patients who reported being out-of-body during their cardiac arrests, and what those people did was look at their bodies. One looked at her body and went out of the window. Another found a tunnel. One simply went back into the body as quickly as she could. Another went out through the wall backwards.

Clearly there is something wrong with this methodology. For if people do leave their bodies and look around the room, they do not gain the sort of information that we want them to gain – at least not through this research protocol. So we are designing a new experiment, very much like the study Greyson and Holden are conducting in Charlottesville, Virginia.

Imagine a cardiac care unit room. In a corner of the ceiling is someone who has left his or her body and is looking back down on the physical body. What we are going to do is to make sure that whatever object we use is something that a patient who leaves the body and looks down at it could not fail to see. One suggestion is that we should suspend from the ceiling a display screen between the person who is up at the ceiling and the physical body. The screen would be translucent, and would display some randomly generated image that is not visible from below, so the out-of-body person has actually got to look through the screen to see the physical body. A camera would record the whole of the resuscitation process, so that we can see if, after resuscitation and stabilization, the patient can accurately report what was displayed on the screen while he or she was unconscious and being resuscitated.

### **Approaching-Death Experiences and the NDE: A Model for the Dying Process?**

In the final part of this presentation, I would like to try and put the near-death experience in the context that I feel it deserves. Is the NDE

a model for the final stage of dying? My current view is that it may be. My reasoning begins with those experiences that I call approaching-death experiences, which sometimes occur in the 24 hours before death. These consist of “take-away” deathbed visions of relatives or friends; experiences of light and other worlds; and deathbed “coincidences,” that is, visits by the dying person to friends or relatives at the time of death. We, in fact, have three studies ongoing at the moment. One is a study with a palliative care team, asking caregivers about approaching-death experiences in the dying for whom they are caring; a paper describing this study has been accepted by the *American Journal of Hospice and Palliative Medicine*. Another is a study in hospices in Holland, looking at patients’ accounts of their experiences as they approach death. Thirdly, we are in the process of setting up a hospice study in the U.K.

Now what are these deathbed visions? On St. Francis’s tomb, there is a lovely picture of St. Francis when he was dying. He has several beautiful angels hovering over him, waiting to accompany him into death: a wonderful deathbed vision. I know that I will not have lovely people like that; I will just have my relatives. Just to give you a flavor of what the dying seem to see, here is a wife’s description of her husband’s death, from a paper by Paola Giovetti (1999, p. 38): “The gauze over his face moved, I ran to him and with his last strength he said to me: ‘Adrianna, my dear, your mother (who had died three years before) is helping me break out of this disgusting body. There is so much light here, so much peace.’” Forty percent of the approaching-death experiences Giovetti found were these “take-away” visions.

The next common approaching-death experience is of transiting to a new reality. This story was told to me by a woman who was with her 32-year-old daughter as she was dying of breast cancer. In her last two to three days, the daughter described being conscious of a dark roof over her head; then she would go up and go through the roof into a bright light. She moved into a waiting place where beings were talking to her, to help her through the dying process. She conveyed to her mother that everything would be okay, that these were loving beings, and that her grandfather was amongst the beings. She was able to move in and out of this reality, and she was quite clear that it was not a dream. We have been given other accounts by people who describe waiting in a garden, which sounds very similar to the sort of garden that NDErs describe. Light and love are absolutely primary to these experiences.

The third type of approaching-death experience is the deathbed coincidence, in which the dying persons go to visit somebody to whom

they are close, to tell that person that they are dying. This is a fresco of St. Francis dying in one part of Italy. Here, in another part of Italy, is another prelate who is dying, and just as he is about to die, he suddenly sits up, sees St. Francis, and says, "Wait for me, wait for me, St. Francis; I'm coming." He seems to have paranormal knowledge that St. Francis is dying at the same time.

Here is a more recent example, reported retrospectively:

Around 1950, a distant relative, John, was in hospital. It was a Sunday, and my father went to visit John, to be told that he had died that morning at a certain time. The hospital authorities asked dad if he would inform the next of kin, the deceased's sister Kate and her husband, who were sheep farmers living in a relatively remote part of the country and not on the telephone. Dad and I drove the 20 or so miles and up a hill track to the farmhouse to be met by Kate who said, "I know why you have come – I heard him calling me, saying 'Kate, Kate' as he passed over." She was quite matter-of-fact about it. She gave us the time of death, which was exactly the same as recorded by the hospital. I found it an amazing experience and have never forgotten it, nor will I ever. I was about 17 at the time.

Now, these experiences are common, and whenever I give a talk on approaching-death experiences, someone in the audience always has some experience to report. What we hope to do is find out exactly how common they are. We are building on the work of previous researchers such as Karlis Osis and Erlendur Haraldsson (1977), who examined deathbed visions in terminally ill patients in the United States and India. Other phenomena are also frequently reported at the time of dying. Light at death is very common. A mother in one of our studies whose son was age 7 and dying of leukemia in the hospital told us that, as he became more seriously ill, the curtains were drawn around his bed. She told us that, in the 20 minutes before he finally stopped breathing, the whole area around his bed was flooded with light – the same light that you talk about in the near-death experience: the light of love and compassion. And as he died, the light slowly faded.

I have been given other accounts which are very similar to that. Here is one from a woman whose husband was dying:

Suddenly there was the most brilliant light shining from my husband's chest, and as this light lifted upward, there was the most beautiful music and singing voices. My own chest seemed filled with infinite joy, and my heart felt as if it was lifting to join this light and music. Suddenly, there was a hand on my shoulder, and a nurse said, "Sorry, love. He's just gone." I lost sight of the light and the music and felt so bereft at being left behind.

Once again, we see the phenomena of light, love, and music at the time of death. reminiscent of music described by NDErs.

Could approaching-death experiences and the NDE be a model for the dying process? If so, it would point towards consciousness beyond death. The brain identity theory says that consciousness ends with brain death. But if it can be shown in the cardiac arrest model that people can acquire information when they are unconscious and out of their body, if deathbed coincidences are real, it would be indisputable evidence that consciousness is separate from the brain. The brain identity theory – the reductionist view that consciousness is entirely dependent on brain function – then must fail, and this would have a heavy cost for science. Do not underestimate this cost. Science would have to change in a fundamental way, and so, interestingly, would our social structures. Because the theory also presupposes that consciousness does not survive death, and the evidence is beginning to be against that, too.

The nonreductionist view is that there is a process to dying. There is apparent separation of mind and brain. Love and light are fundamental to the dying experience. And the suggestions are that, in fact, love and consciousness are the fundamental ground structure of the universe and that consciousness may survive death of the body. So perhaps the near-death experience will help us to change science and to change our culture and bring back personal responsibility for our actions, if there is, indeed, continuing consciousness after death.

Will we ever really know? Perhaps, but let me end with a Zen parable. A nobleman asked Master Hakuin, “What happens to the enlightened man at death?”

“Why ask me?” said Hakuin.

“Because you’re a Zen master.”

“Yes, but not a dead one.”

## **Responses to Selected Questions From the Audience**

**Question:** Is there a difference between hallucinations and NDEs?

**Dr. Fenwick:** People tend to forget their hallucinations, whereas NDEs remain absolutely clear. If you ask people about the nature of their experiences while they are in the intensive care unit, you find they have a totally different flavor from NDEs. They have hallucinations, many of which are illusions based on what is going on

in the intensive care unit, and they are usually strongly paranoid. For example, one patient felt that everybody in the unit was against her, that devils were poking her, and that she was being roasted. As she slowly came to consciousness, she realized that the roasting was being on the hot warming pad on the bed, and the devils were the nurses giving her intravenous fluids and injecting her. Now experiences like those do not have the clarity; they do not have the narrative quality; they do not certainly have the positive emotional valence of the typical near-death experience. So I think, at long last, we are beginning to be able to draw a distinction between hallucinations due to altered brain chemistry and the near-death experience. I think they are different.

**Question:** Does the NDE give us insight into the structure of the universe?

**Dr. Fenwick:** This is a really wonderful question, and it goes right to the heart of our understanding of what the universe is and how it is constructed. Physicist Amit Goswami (Goswami, Reed, and Goswami, 1995) argues that the basic ground structure of the universe is love and consciousness, and that the physical universe is a manifestation of this ground state. He has a theory relating to quantum mechanics about how every moment that we perceive something, we do create the physical world of that perception, and we create it essentially from the ground structure of the universe. So he argues that consciousness is primary and not an epiphenomenon of the brain. Goswami is very much in the Buddhist tradition, and this is the Buddhist view of the world. Now let us just go back to the experiences people have of the universe and how in these wide experiences they define its structure. So again, let us try to follow the data.

These very wide experiences are called transcendent experiences. About 30 percent of the population will have weak transcendent experiences, and about 10 percent strong transcendent experiences, very similar to NDEs, in which they see through into the structure of the universe. Everybody who has had this experience



is very clear: that the universe is composed of love and consciousness. And when they see the structure of plants, matter, people, the whole thing, they say that it is composed of love and consciousness. That is what they say. Now, that is very similar to what people say about their experience in the NDE, and that would also fit in with Goswami's model.

You probably know that a large number of astronauts had transcendent experiences. Edgar Mitchell is one (Mitchell and Williams, 1996). But the astronauts who were in control of the capsule did not have these experiences because they were busy with calculations and responsibilities. It was the guys that could stare out of the windows, who were not doing so much, who had the luxury of contemplation, who had transcendent experiences. And, again, if you talk to Mitchell, he will tell you quite simply that the universe is a universe of consciousness and love. Goswami's ideas go along with this, but the challenge is in formalizing these observations so that they can, in fact, be used by science.

Question: In childbirth, people are not dying, so why do they have NDEs?

Dr. Fenwick: The NDE has many different causes, and can occur for different reasons. My own view is that the NDE at its limit transforms itself into a transcendent experience, and I am not sure that you can distinguish between NDEs and transcendent experiences. For example, some people have the NDE when they are relaxed, or in a dream, or when they are asleep, and the experience then seems to be much better classified as a true transcendent experience. In a true near-death experience, large changes in physiology are involved; the typical near-death experience which then occurs has many features that will allow its classification also as a true transcendent experience. Some people who do get very seriously ill in childbirth drop their blood pressures and may have catastrophic bleeds. During this medical crisis a true NDE is often experienced. In summary, near-death experiences are transcendent experiences, but transcendent experiences can also occur when you are not actually near death.

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