Cardiac Arrest and Near-Death Experiences

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ABSTRACT: Recent prospective studies of the incidence and character of near-death experiences (NDEs) during cardiac resuscitation have aroused new interest in the true nature of these profound experiences. Those who believe in the reality of an invisible and immaterial soul claim these studies support their belief. However, careful analysis reveals these experiences can be explained by changes in body function. This article describes the process of cardiac resuscitation in some detail, explains how known data on cardiac resuscitation predict the incidence of these experiences, as well as how the functioning of the body during cardiac resuscitation explains the experiences undergone during NDEs such as out-of-body experiences, tunnel and darkness experiences, sensations of transcendence, and ineffability. Furthermore, the functioning of the human body during cardiac resuscitation also explains the veridical observations made during some NDEs. This article offers a full explanation of NDEs occurring during cardiac resuscitation based solely upon human physiology.

KEY WORDS: out-of-body experiences; near-death experiences; cardiac arrest; neurocognitive changes; oxygen starvation; hypoxia.

The heart is a pump made of meat instead of metal, and the heartbeat is a manifestation of the pumping action of the heart. Normally the heart pumps a flow of blood into the tissues and organs of the body, transporting vital substances such as oxygen, nutrients, hormones, and many other substances into these tissues and organs.

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Cessation of this vital pumping action of the heart is called cardiac arrest. But cardiac arrest is not a single disorder. Instead it is a collective name for the effects of an abnormal heartbeat that has either ceased altogether, or is so abnormal that the heart no longer pumps blood into the tissues and organs of the body. All bodily tissues and organs rapidly fail and die when the heart ceases to pump blood. Cardiac arrest is a medical disaster that, when untreated, always causes death.

A person who suddenly experiences a cardiac arrest experiences all the effects of sudden cessation of blood flow to all organs and tissues of the body. Of all the tissues and organs of the body, the eyes and the brain are most sensitive to the effects of sudden cessation of blood flow. Everyone is unconscious 4 to 20 seconds after sudden cardiac arrest (Aminoff, Scheinman, Griffin, and Herre, 1988; Rossen, Kabat, and Anderson, 1943), and ever-increasing degrees of brain damage occur in direct proportion to the time that a cardiac arrest lasts longer than 3 minutes (Safar, 1988). After about 10 minutes the degree of brain damage is so severe that brain death, which is irreversible death of the brainstem, is present (Safar, 1988), and the body of the affected person will never regain consciousness. The body of the affected person is then truly dead.

**Cardiac Resuscitation**

Upon making a diagnosis of cardiac arrest, doctors and nurses in all modern hospitals immediately initiate a standard chain of events. They sound an alarm summoning a special resuscitation team, while at the same time rapidly beginning the initial phases of resuscitation. The resuscitation team members place a hard plank under the chest of the person, perform artificial respiration with a mask and balloon, insert an intravenous line through which medicines necessary to treat the cause of the cardiac arrest can be administered, and perform cardiac massage. This whole procedure is called cardiac resuscitation, a dramatic and intense medical treatment.

Those applying cardiac massage vigorously and forcefully compress and release the chest 60 to 120 times per minute. It is a tiring and exhausting procedure. The purpose of cardiac massage is to pump blood around the body during periods that the heart does not pump because of a cardiac arrest. How does cardiac massage work? The heart is a hollow ball of muscle tissue with four one-way valves. Compression of the chest forces blood out of the cavities of the heart and the chest, and
because of the one-way valves in the heart, blood emerges out of the heart into the arteries, which conduct it into the various tissues and organs of the body. Releasing the chest causes the chest to rebound to its original form, creating a negative pressure within the chest and heart, thereby sucking blood into the chest and the heart. Compression of the chest repeats this cycle.

Breathing always stops in those people rendered unconscious by a cardiac arrest, so artificial respiration is also applied so as to provide oxygen to the body. Cardiac massage and artificial respiration are the two absolutely essential components of cardiopulmonary resuscitation (CPR). Cardiac massage together with artificial respiration pumps oxygen-containing blood around the body, thereby sustaining the viability of all body tissues and organs until normal breathing, heart-beat, and pump action of the heart is restored. Cardiac massage and artificial respiration are always applied during cardiac arrest. Failure to do so means that no oxygen-containing blood is pumped around the body of the person with a cardiac arrest, and that person will die.

Near-Death Experiences During Cardiac Arrest

Some people successfully resuscitated from a cardiac arrest report undergoing wondrous experiences during resuscitation. They tell of meeting God, other deities, spirits, angels, and deceased relatives. They tell of passing through tunnels to enter a heavenly light. They tell of undergoing out-of-body experiences (OBEs) during which they observed all that happened to and around their bodies during resuscitation. These reports are called near-death experiences (NDEs). Indeed the NDE reports of some people contain verifiable details of events occurring at a time these people were apparently dead. People telling these things had no heartbeat and no respiration at the time; indeed, they appeared very unconscious and very dead at the time the things they reported occurred. These veridical accounts are a source of amazement, giving rise to much speculation and hope about the possibility of a life after death. Many people even regard them as positive proof of a life after death, pointing out that OBEs and veridical observations made during clinical death, defined as absence of heartbeat and respiration, are proof of an invisible and immortal human soul.

Pim van Lommel and his co-workers performed an outstanding prospective study of the incidence and manifestations of NDEs in cardiac arrest survivors in The Netherlands (van Lommel, van Wees,
Meyers, and Elfferich, 2001). They found that 62 (18 percent) of the 344 survivors interviewed reported undergoing an NDE. A similar study was performed by Sam Parnia and his co-workers in England, who found that 7 (11.1 percent) of the 63 interviewed survivors reported undergoing an NDE (Parnia, Waller, Yeates, and Fenwick, 2001). The authors of both articles were at a loss to explain the fact that some of these patients could have undergone conscious experiences such as NDEs at a time when they not only were very evidently unconscious, but also at a time they had neither heartbeat nor breathing activity. One of the patients interviewed by van Lommel and his co-workers even underwent a veridical experience during a period he appeared to be unconscious. A coronary care unit nurse reported his experience as follows:

During a night shift an ambulance brings in a 44-year old cyanotic, comatose man into the coronary care unit. He had been found about an hour before in a meadow by passers-by. After admission, he receives artificial respiration without intubation, while heart massage and defibrillation are also applied. When we want to intubate the patient, he turns out to have dentures in his mouth. I remove these upper dentures and put them onto the ‘crash car.’ Meanwhile, we continue extensive CPR. After about an hour and a half the patient has sufficient heart rhythm and blood pressure, but he is still ventilated and intubated, and he is still comatose. He is transferred to the intensive care unit to continue the necessary artificial respiration. Only after more than a week do I meet again with the patient, who is by now back on the cardiac ward. I distribute his medication. The moment he sees me he says: ‘Oh, that nurse knows where my dentures are.’ I am very surprised. Then he elucidates: ‘Yes, you were there when I was brought into hospital and you took my dentures out of my mouth and put them onto that car, it had all these bottles on it and there was this sliding drawer underneath and there you put my teeth.’ I was especially amazed because I remember this happening while the man was in deep coma and in the process of CPR. When I asked further, it appeared that the man had seen himself lying in bed, that he had perceived from above how nurses and doctors had been busy with CPR. He was also able to describe correctly and in detail the small room in which he had been resuscitated as well as the appearance of those present like myself. At the time that he observed the situation he had been very much afraid that we would stop CPR and that he would die. And it is true that we had been very negative about the patient’s prognosis due to his very poor medical condition when admitted. The patient tells me that he desperately and unsuccessfully tried to make it clear to us that he was still alive and that we should continue CPR. He is deeply impressed by his experience and says he is no longer afraid of death. 4 weeks later he left hospital as a healthy man. (van Lommel, van Wees, Meyers, and Elfferich, 2001, p. 2041)
Van Lommel and Parnia and their co-workers were at a loss to explain how people could undergo such conscious veridical experiences or other conscious experiences such as NDEs while evidently unconscious. Van Lommel and his co-workers summed this up:

With lack of evidence for any other theories for NDE, the thus far assumed, but never proven, concept that consciousness and memories are localised in the brain should be discussed. How could a clear consciousness outside one's body be experienced at the moment that the brain no longer functions during a period of clinical death with flat EEG? Also, in cardiac arrest the EEG usually becomes flat in most cases within about 10 s from onset of syncope. Furthermore, blind people have described veridical perception during out-of-body experiences at the time of this experience. NDE pushes at the limits of medical ideas about the range of human consciousness and the mind-brain relation.

Another theory holds that NDE might be a changing state of consciousness (transcendence), in which identity, cognition, and emotion function independently from the unconscious body, but retain the possibility of non-sensory perception. (van Lommel, van Wees, Meyers, and Elfferich, 2001, p. 2044)

Yet no invisible and immaterial soul or separate consciousness is required to explain all the experiences reported in these two prospective studies. All the experiences reported, even the veridical experiences, can be explained by the functioning of the body. I will begin by first addressing the matter of the use of electroencephalograhic apparatus during cardiac resuscitation, as well as the phenomenon of consciousness.

**Brain Activity and Consciousness**

Recent popular literature makes much of the fact that people had flat or absent electroencephalograms (EEGs) during the NDEs they reported undergoing during cardiac resuscitation. This is a very dubious statement. During a medical career spanning more than 20 years, in which I have attended cardiac resuscitations in three different countries, I have never seen EEG electrodes being attached to people undergoing an unexpected cardiac resuscitation. Attachment of EEG electrodes to a person’s head is a laborious process, difficult to do accurately. There is simply no opportunity to do this during a cardiac resuscitation: the head is shaking due to cardiac massage, and moving due to artificial respiration with a face-mask, a situation during which
it is also almost impossible adequately to set up a sensitive EEG machine. Sometimes people are attached to EEG machines during cardiac arrests, but these are situations where people unexpectedly develop cardiac arrests while already attached to EEG machines, or research situations where people undergo experimental cardiac arrest (Aminoff, Scheinman, Griffin, and Herre, 1988).

Now the main purpose of cardiac resuscitation is to restore some flow of blood containing oxygen to the brain; otherwise, cardiac arrest would invariably be fatal. Restoration of oxygen and blood flow to the brain partially or completely restores brain nerve cell electrical activity. But an EEG machine only measures electrical activity in the surface layers of the brain, and does not directly register electrical activity of deeper lying brain tissues. A functioning upper brainstem is absolutely essential for the manifestation of consciousness, a fact well established by countless human and animal experiments. And the brainstem is located deep within the brain, far from the locations of EEG electrodes. This is why normal EEG electrode positions do not specifically register brainstem electrical activity. Instead they measure only the effects of brainstem nervous activity on brain surface electrical activity, as measured with EEG electrodes in the standard positions. So absence of EEG activity does not always mean that a person is unconscious. Accordingly, statements to the effect that NDEs during cardiac arrest occur during periods of absent brain electrical activity correspond neither with physiological fact nor with common medical practice.

Consciousness is a truly wondrous phenomenon. The exact meaning of consciousness and the actual nature of consciousness are exceedingly difficult subjects, yet most people know when it is present and when it is not. For example, when we look at an awake person, we know that person is conscious. But if that same person has been rendered unconscious due to anesthetic drugs, oxygen starvation, or a blow to the head, we know that person is unconscious, because that person does not move, does not react, does not interact with his or her surroundings, and has no memory of events during the period of unconsciousness. This is a very bare and basic approach to a dazzlingly complex subject, when one considers that the complex human mind is defined by consciousness. Yet consciousness is a function of a functioning brainstem, and when the brainstem ceases to function due to any one of a multitude of factors, such as anesthetic or other drugs, oxygen starvation, or a blow to the head, consciousness – and with it human mind – cease to be. This is why true death of the body is defined
as terminal loss of consciousness caused by irreversible brainstem death (Woerlee 2003).

There are many who believe consciousness is generated by the soul, or something "spiritual," insubstantial, or wondrously isolated from the body. This concept is impossible to prove, because even if the soul generates consciousness and is the seat of the mind, the soul must still arouse the body to consciousness by means of the mechanisms of the brainstem. After all, when the brainstem no longer functions, bodily consciousness is not present, whether or not the soul exists. Accordingly, it is impossible to differentiate whether the soul generates consciousness, or whether the brainstem generates consciousness. If the soul generates consciousness, then the brainstem is still required as a physical conduit for the manifestation of consciousness; otherwise, consciousness simply will not manifest. And if there is no soul, then the brainstem is the generator of human consciousness (Woerlee 2003).

### Effects of Oxygen Starvation

This brings us to the effects of oxygen starvation on tissue function. The function of the lungs is to get oxygen from the air into the body, while the heart is a pump, pumping oxygen-containing blood from the lungs, together with nutrients and many other substances, to all the tissues and organs of the body. All body tissues and organs need oxygen and nutrients to sustain function and life. Most tissues and organs of the body contain a small reserve of nutrients; but no bodily tissues and organs contain any reserves of oxygen. Furthermore, the oxygen consumption of bodily tissues and organs is so high that a continuous flow of blood containing oxygen is absolutely necessary to sustain function and life. And the eyes and the brain require more oxygen than any other tissues and organs of the body, although the eyes require more oxygen to function than does the brain, and the cortex of the brain requires more oxygen than does the brainstem (Liere and Stickney 1963; Woerlee 2003). This is why sudden cessation of the flow of blood to the head, such as occurs during cardiac arrest, causes rapid failure of the eyes and the brain, which manifests as blindness and paralysis of all muscles after 3 to 19 seconds, followed by loss of consciousness after 4 to 20 seconds, shortly after which the EEG becomes flat (Aminoff, Scheinman, Griffin, and Herre, 1988; Rossen, Kabat, and Anderson, 1943). Unconsciousness and death due to cardiac arrest are always due to failure of oxygen supply to the brainstem.
Most of the patients involved in the studies of van Lommel and Parnia were certainly unconscious at the time the resuscitating physicians and nurses arrived. But once cardiac resuscitation was commenced, restoration of a degree of circulation restored some oxygen supply to their brains. So some blood and oxygen did circulate through their brains, sustaining the life in their brains and bodies until normal heartbeat and circulation could be restored. And in some of these people undergoing cardiac resuscitation, the efficiency of the cardiac massage was such that enough blood and oxygen was pumped through their brains to sustain partial or even full consciousness. But how much blood is pumped out of the heart during cardiac massage, and how much oxygen-containing blood must be pumped out of the heart to sustain consciousness? Here are some figures and calculations.

First, pressure of oxygen in the blood of people undergoing cardiac resuscitation is, on average, 0 to 250 mm Hg (Ornato, Gonzalez, Starke, Morkunas, Coyne, and Beck, 1985; Smithline, Rivers, Rady, Blake, and Nowak, 1994; Steedman and Robertson, 1992; Tucker, Idris, Wenzel, and Orban, 1994). The ranges of measured oxygen pressures in the arterial blood of these people is such that the hemoglobin of all resuscitation patients was nearly always more than 90 percent saturated. This means that the blood pumped by the heart during cardiac resuscitation contains a normal amount of oxygen.

Second, the hemoglobin concentration of people undergoing sudden cardiac arrest is normal, which means that the oxygen content of the arterial blood pumped out of the heart into the body during cardiac arrest is also normal to maximal. In this situation, the supply of oxygen to the tissues and organs of the body is solely determined by the volume of blood pumped by the heart.

Third, the amount of blood pumped by the normally beating adult heart at rest is 4.5 to 6.5 liters/minute.

And fourth, the amount of blood pumped by the heart as a result of external cardiac massage is 0 to 2.2 liters/minute (Christensen, Stadeager, and Siemkowicz, 1990; Del Guercio, Coomaraswamy, and State, 1963; Del Guercio, Feins, Cohen, Coomaraswamy, Wollman, and State, 1965).

If blood contains normal amounts of oxygen, then what flow of blood through the brain is needed to sustain consciousness? The adult human brain weighs about 1500 grams. Normal flow of blood to the adult brain is about 54 milliliters/100 grams of brain tissue/minute, which means a total flow of blood through the adult brain of about 810 milliliters/minute. Minimum flow of blood needed to sustain con-
sciousness in humans is about 15 milliliters/100 grams of brain tissue/minute (Sundt, Sharbrough, Piepgras, Kearns, Messick, and O'Fallon, 1981; Trojaborg and Boysen, 1973), which means a total minimum blood flow of about 225 milliliters/minute in the average 1500 gram adult brain. About 13 percent of the blood pumped by the heart goes to the brain; the rest sustains the rest of the body. So the heart must pump at least 1730 milliliters of blood with normal oxygen content per minute to sustain some sort of consciousness in an average adult body. Studies of the efficiency of cardiac massage reveal that cardiac massage generates a flow of blood greater than 1730 milliliters/minute in no more than 20 to 24 percent of persons undergoing cardiac massage (Christensen, Stadeager, and Siemkowicz, 1990; Del Guercio, Coomaraswamy, and State, 1963; Del Guercio, Feins, Cohen, Coomaraswamy, Wollman, and State, 1965).

This means that as many as 20 to 24 percent of people undergoing cardiac massage during a cardiac arrest may be getting enough oxygen to their brainstems to be partially or fully conscious. Most of these people will only be partially conscious, but a few may be fully conscious. And these people may be conscious but unable to move, because even though the flow of oxygen (transported in blood) to their brains may be sufficient to sustain consciousness, it may not be sufficient to enable normal movement. This sounds surprising, but people undergoing moderate to severe brain oxygen starvation due to cardiac arrest (or any other form of oxygen starvation) can be in a condition in which they are paralyzed and unable to move, yet conscious and able to hear all that is happening around them (Lier and Stickney, 1963; Rossen, Kabat, and Anderson, 1943). All this explains how it is that unmoving, unresponsive, apparently dead people undergoing cardiac resuscitation for cardiac arrest can undergo conscious experiences such as an NDE. Furthermore it explains why only 11 to 18 percent of these people undergo, or rather can remember, such conscious experiences. This is the situation in which the patients reporting NDEs after successful resuscitation from cardiac arrest found themselves during their NDEs.

Physiology of Cardiac Arrest

So what usually happens during a cardiac arrest? Most people are discovered in a hospital ward, on a street, or elsewhere, and usually more than a minute has passed before resuscitation is started. This means that most of these people are certainly unconscious at the time
The contact point for cardiac resuscitation commences, because all people are unconscious 4 to 20 seconds after cessation of heartbeat, as noted above. Cardiac resuscitation is started: artificial respiration inflates and deflates the lungs with air, oxygen in the air in the lungs combines with the hemoglobin in blood passing through the lungs, cardiac massage pumps this oxygen-enriched blood into all the tissues and organs of the body, and drugs such as adrenaline are administered to increase the blood pressure generated by cardiac massage. Such cardiac resuscitative measures are sufficient to restore some degree of consciousness in about 20 percent of those undergoing resuscitation, even though these people neither breathe nor have any heartbeat.

But restoration of consciousness means simply that the upper brainstem functions sufficiently to sustain consciousness. Consciousness does not mean that the rest of the brain functions normally. The effects of total brain oxygen starvation lasting for more than 60 seconds, such as is caused by cardiac arrest, can last several minutes, or even be permanent if total oxygen starvation lasts more than three minutes (Dougherty, 1994; Safar, 1988). So even though these people are conscious, their brains do not function normally. The human brainstem, cortex, and eyes have the same structure and function in all humans, regardless of race or sex. This is why the manifestations of each degree of brain oxygen starvation are essentially the same for each person, although these manifestations may be covered with a sheen resulting from individual psychological and sociocultural factors. So what are the basic changes in mental function due to severe oxygen starvation that people may experience (Woerlee 2003)?

First, prefrontal cortex malfunction results in sensations of calm, serenity, indifference, and sometimes even exultation, despite full appreciation of the seriousness of one's situation during resuscitation for cardiac arrest. Furthermore, pain is no longer perceived as pain.

Second, supplementary motor cortex failure means people do not even think of moving, even though they realize the dire nature of their situation during OBEs where they observe their apparently dead bodies being resuscitated.

Third, precentral cortex (primary motor cortex) malfunction causes paralysis of voluntary muscles so that people cannot move, even though they may try to do so. Paralysis of the adjacent areas of the motor cortex controlling eye muscles, as well as speech muscles in Broca's area, means that people also cannot move their eyes or speak, even though they try their hardest to move their eyes and speak. All they can do is to lie unmoving, unable to move – and they look horrible, even dead.
Fourth, postcentral gyrus malfunction causes failure of conscious perception of sensations of touch.

Fifth, parietal cortex malfunction causes disintegration of differentiation between body and space, resulting in a sense of oneness and union with the universe.

Sixth, malfunction of the angular gyrus, together with muscle spindle malfunction, can cause displacement of body image, together with sensations of movement and flying, which when combined with conscious and unconscious perceptions of their own bodies as well as their surroundings, result in the OBE.

Finally, the amygdala and the hippocampus are also very sensitive to the effects of oxygen starvation. Malfunction of these deeper parts of the temporal lobe can arouse memories of people, music, and a life review.

This attribution of specific functions to specific parts of the brain may sound like a modern form of phrenology to some people. Indeed some neurologists even laughingly dub it “neurophrenology,” but a veritable flood of published magnetic resonance imaging (MRI) studies during the last 15 years, together with earlier radioisotope studies as well as clinical data, all confirm that many functions are indeed localized in specific parts of the brain.

**Physiology of Visionary Experiences**

This brings this discussion to the subject of visionary experiences. The basic nature of the visionary experiences is certainly a product of the degree of brain failure caused by oxygen starvation, although personal expectations, upbringing, and sociocultural factors certainly do influence the content of the visionary experiences, as is proven by various aspects of visionary experiences. (See http://www.mortalminds.org for a more extensive discussion on the visionary aspects of NDEs.)

First, people expecting to undergo a life-threatening experience are more likely to undergo affective and transcendental NDEs than cognitive NDEs, while those who unexpectedly find themselves in a life-threatening situation are equally likely to undergo affective, transcendental, or cognitive NDEs (Greyson, 1985).

Second, people expecting to die often see visions of deceased relatives; presumably these will act as their guides in the world of the dead (Greyson, 1985).
Third, the nature of the deceased relatives seen during these NDEs differs from one culture to another (Osis and Haraldsson, 1977).

Fourth, Hindus have Hindu NDEs, Buddhists have Buddhist NDEs, and Christians have Christian NDEs (Evans-Wentz, 1957, pages 33–34).

Fifth, the reason for return to life differs from one culture to another (for example, Pasricha and Stevenson, 1986).

Some people may report apparently paranormal perceptions. But paranormal perceptions are no more than an ancient human illusion (Woerlee 2003).

Tunnel and light experiences are also products of changes in body function occurring during resuscitation (Woerlee, 2003, 2004). Pupil widening due to adrenaline, which is normally administered during cardiac resuscitation, as well as oxygen starvation, allows more light to enter the eyes, so they see a “bright light which does not hurt the eyes.” Pupil widening reduces eye focal depth, so that that at which they look is seen clearly, but everything else is vague and “bathed in light.” So people with pupils widened by oxygen starvation and adrenaline see vague forms of light; these are the angels and heavenly figures sometimes seen during NDEs and deathbed experiences.

Because these experiences are so powerful, have such an impact, and seem so coherent and logical, people consider them strange and wondrous, believing it is impossible for these things to originate in a sick, oxygen-starved brain. However, it should always be remembered that the perceptions of people undergoing a toxic or abnormal mental state, such as is caused by oxygen starvation, are very different from those of their observers. The mental state of oxygen-starved people has been beautifully described as follows:

Hypoxia (oxygen starvation) quickly affects the higher centers, causing a blunting of the finer sensibilities and a loss of the sense of judgement and of self-criticism. The subject feels, however, that his mind is not only clear but unusually keen. (Liere and Stickney, 1963, p. 300)

This is why people recovering from cardiac resuscitation never say their mental state during a period of consciousness such as an NDE was confused or befuddled.

**Final Facts**

People reporting an NDE after resuscitation from a cardiac arrest are always reporting a remembered experience. After all, none of the
people who have undergone NDEs during cardiac arrest ever successfully indicates during the resuscitation that he or she is awake. Instead they report their NDEs only after arousing and recovering to a condition during which they can tell of their experiences. This means that what they are reporting is actually a composite memory: memories of observed fact, memories of hallucinations induced by drugs and oxygen starvation, as well as memories of bodily sensations experienced during resuscitation. The totality of these memories forms a complete experience whose content is interpreted and modified by individual sociocultural experiences and expectations, to be ultimately molded into a coherent NDE report containing these elements. Brain oxygen starvation is a major determining factor in cardiac arrest NDEs, because brain oxygen starvation inhibits formation of memories, and some degree of brain oxygen starvation is always present during cardiac resuscitation. This is why not everyone who was conscious during cardiac resuscitation can remember the details of every experience undergone during cardiac resuscitation.

Knowledge of all these things makes it possible to explain the veridical experience cited above (van Lommel, van Wees, Meyers, and Elfferich, 2001). The patient van Lommel and colleagues described was conscious as a result of efficient cardiac resuscitation. He could see and he could hear, because when resuscitation is this efficient, the senses of hearing and sight are restored. The residual effects of extreme oxygen starvation on his brain paralyzed him, making it impossible for him to move or speak, so he was unable to tell those resuscitating him to continue. The effects of oxygen starvation meant he felt no pain, and also aroused his OBE. He felt his dentures being removed, and he heard them being placed in a metal drawer; a metal drawer opening and closing makes a very typical sound, and metal bedside cabinets are standard hospital furniture in The Netherlands. His eyes were partially open, or were opened every now and then to check pupil size as an indication of brain oxygen starvation; so he was able to see his brother and others in the room. This is why he was later able to recognize people, as well as to describe the room. In addition, the sounds and the movements heard and felt during resuscitation also aided him in building a composite picture of all that happened during his resuscitation. After awakening, he was able to tell a composite story of all that happened during his resuscitation. So this ostensibly supernatural experience is actually readily explained by the functioning of the body, together with conscious and unconscious observations.
Supernatural or paranormal explanations are not needed to explain what those undergoing NDEs during resuscitation for cardiac arrest experience. Nor are explanations such as a soul, or a mind that exists separately from the body, required. The functioning of the body predicts the incidence of NDEs occurring during cardiac resuscitation, as well as explaining every experience undergone during such NDEs. The functioning of the body, together with natural physical laws, explains all these phenomena. All these things reduce the likelihood that the NDE is a manifestation of the reality of an invisible and immaterial mind able to separate from the body. Even so, this explanation can only be considered an alternative explanation. After all, an invisible, immaterial mind able to separate from the body may also be the explanation for NDEs, even though it cannot be sensed or detected in any way, and in no way predicts the incidence or nature of the experiences reported.

Nonetheless, physical explanation of the genesis of the NDE in no way reduces the intensity, or the profound and life-changing nature, of these experiences. The NDE is an intense remembered human experience undergone during a period when the very existence of the person undergoing the experience is threatened. It is an experience whose nature tells us much about the deepest recesses of the individual and collective human psyche, as well as the more wondrous aspects of the functioning of that vehicle of the human mind, the human body.

References


