

Response to G.M. Woerlee's Critique of Dr. Long's Research

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After reading Dr. Woerlee's critique of Dr. Jeffery Long's NDE research, [Review of Evidence of the Afterlife](#), I was rather frustrated at what I felt was a sloppy effort on Dr. Woerlee's part. I think it is very important that we hold those who make claims and those who rebut claims to the same level of scientific scrutiny. Therefore, in the spirit of science, I offer this paper as a response to Dr. Woerlee's critique. This document is formatted to follow the same sectional outline that Dr. Woerlee used in his critique of Dr. Long.

1. Lucid Death

Dr. Woerlee states that "Jeffrey Long proceeds to make the same unbelievable assumption as just about all other doctors publishing studies of near death experiences during cardiac arrest. He forgets to tell us that all those who survived cardiac arrest underwent cardiac massage. They survived cardiac arrest because of undergoing cardiac massage, because without undergoing cardiac massage people remain dead, and cannot tell of their near death experience. Another classic example of this faulty way of thinking is that of the Dutch cardiologist Pim van Lommel in his Lancet article published in 2001 ([see page 2044 of Lommel 2001](#))."

Dr. Woerlee should be embarrassed by these statements. Dr. Long DID NOT forget to tell us that "all those who survived cardiac arrest underwent cardiac massage." He didn't tell us, because it is simply not true! Dr. Woerlee is a trained Anesthesiologist and should be well aware of the fact that defibrillation alone is used to revive patients in many cases that present with shockable rhythms. He repeated this same faulty argument on his website in this article: <http://unholylegacy.woerlee.org/lommel.php>

In order to clarify this, I consulted my sister who is a cardiac care nurse and has advanced life support certification. Basically, that means she is trained to lead resuscitation efforts before the doctors arrive. She is trained to read heart rhythms, give medications, perform chest compressions and use defibrillators. She explained the in-hospital CPR procedures as follows.

"There are medical factors that help us determine the type of CPR that will be given at the onset of Cardiac arrest. When dealing with In-Hospital cardiac arrest where patients are already being monitored, chest compressions are not used in a lot of the cases. If the patient presents with a shockable rhythm such as ventricular fibrillation (VF), defibrillation is used immediately to attempt to reset the heart to a productive rhythm. In

most cases, when there is a shockable rhythm, the heart is restarted with defibrillation alone."

This seems to be consistent with Van Lommel's results, where he indicates that 81% of the 344 patients were resuscitated in the hospital within two minutes of circulatory arrest. It is also important to note that (65-85%) of cardiac arrest rhythms are VF (Ventricular Fibrillation), which is a shockable rhythm. Sources: <http://emedicine.medscape.com/article/VF>, (<http://VanLommel/Lancet.pdf>)

Therefore, I would suggest that based on the two minute resuscitation window noted above and the fact that the patients were resuscitated in the hospital, most of the 81% received defibrillation and probably very little cardiac massage.

My sister went on to say the following:

" When defibrillation does not produce a productive rhythm within 1-2 minutes, medications are usually pushed, chest compressions are started and defibrillation is often attempted again after a short period of time. In cases where there is a non-shockable rhythm such as Asystole, chest compressions are started immediately and medications are given with the hope of restarting the heart or converting the heart into a shockable rhythm, which can then be handled by defibrillation."

In a recent Skeptiko podcast, Alex Tsakiris asked Dr. Woerlee to respond to the criticism that not all cardiac arrest patients receive cardiac massage. The following is an excerpt from the podcast that includes the question and Dr. Woerlee's response:

"Alex Tsakiris: 2) The other thing I would interject while we're talking about heart massage and that; I don't know this, but one of my listeners contacted me and his sister is an emergency care nurse and said that the most common procedure when someone is in hospital and has cardiac arrest is the defibrillator. Pounding on the chest is secondary. The first thing you do is go over and zap them with the paddles. A lot of times, the heart massage is the last resort many minutes later."

"Dr. G.M. Woerlee: As you quite correctly said, in a coronary care unit the first thing they do is defibrillate people. Out on the street or elsewhere in the hospital they don't have this luxury, so they first do cardiac massage. That is what most people undergo."

With all due respect, Dr. Woerlee should have paid closer attention to the Van Lommel study that he quoted and criticized. Table-3 in that same study breaks down the number of NDE patients who received CPR outside of the hospital. Out of 62 patients who reported NDE's, only 13(21%) received CPR outside of the hospital. 49 of the 62 patients received CPR in the hospital only. Dr. Woerlee does correctly point out that outside of coronary care units, hospitals don't always have the luxury of a defibrillator nearby. However, that doesn't seem to apply to the Van Lommel study. Again, he should have

read more carefully. At the beginning of the study publication under the methods section, it clearly states that the patients selected were resuscitated in coronary care units. See this excerpt from the Van Lommel study: (<http://VanLommel/Lancet.pdf>)

"Patients - We included consecutive patients who were successfully resuscitated in coronary care units in ten Dutch hospitals"

The Van Lommel study does not break down whether or not patients received cardiac massage as a part of their resuscitation. However, by looking at all of the other data points, we can reasonably conclude that the following statement by Dr. Woerlee is medically incorrect:

"They survived cardiac arrest because of undergoing cardiac massage, because without undergoing cardiac massage people remain dead, and cannot tell of their near death experience."

Unfortunately, the majority of Dr. Woerlee's critique/rebuttal is based on this faulty assumption.

Dr. Woerlee wrote the following: *"Dr. Long omits to tell the reader that the very process of cardiac massage restores a flow of blood to the brain and even restores the electrical activity of the brain in some cases ([see case 5 in the article by Elton-1961](#))."* He also cites (Swenson-1988) as supporting research.

I have several concerns regarding the relevance of research he cited. They are as follows:

1. The focus of the Swenson study was to compare blood flow between conventional and experimental methods of CPR. It did not involve measuring Cerebral Blood Flow or Cerebral Profusion, both which are needed to maintain consciousness.
2. The study was conducted on humans that were already dead. Consent was given by the families for the research to be conducted. Swenson himself noted that this was potentially problematic when he stated the following: *"These findings should be considered in the context that they were made after a long duration of cardiac arrest after the patient had died and that acidosis was present; the resulting pressures may have been influenced by these and other factors."*

Source: <http://circ.ahajournals.org/cgi/reprint/78/3/630>

3. The article that Dr. Woerlee cited by Elton regarding restoration of electrical activity during CPR, is from 1961 and is one documented case. Also, pay close attention to Dr. Woerlee's wording: *"and even restores the electrical activity of the brain in some cases"*. Since Dr. Woerlee firmly asserts that consciousness requires the physical brain, then he must also assert that consciousness requires brain electrical activity. Therefore, according to his assertions, electrical activity would

need to be present in all patients during cardiac arrest who experience NDE's. His statement above, "*and even restores the electrical activity of the brain in some cases*", with emphasis on the words "*some cases*", seems to hint that he doesn't have a lot of confidence in his own position.

Dr. Woerlee's graphs titled "Cardiac Output generated during External Cardiac massage" and "Mean Arterial Blood Pressures generated during External Cardiac Compression", seek to prove that sufficient blood pressure can be achieved during cardiac massage to maintain consciousness. I have no problem with this claim in general, as there have been a couple of rare reports of patients being awake during CPR. However, I offer the following critique with respect to the manner in which Dr. Woerlee ties this into his NDE rebuttal.

1. Again, Dr. Woerlee is making the faulty assumption that all patients who reported NDE's underwent cardiac massage as a part of their resuscitation effort.
2. Dr. Woerlee constructed the graphs from raw data obtained from multiple sources and studies, most of which are quite old. This is important, because even today it is recognized that measuring cardiac output and blood pressure during cardiac massage is problematic.

Excerpt: "Measuring devices must be capable of detecting the low pressures and flow rates produced during CPR. However, measuring blood pressure or blood flow during CPR is particularly problematic because closed chest compressions produce vigorous motion of the chest and structures within the chest and neck. This movement can impose a great deal of "background noise" on measurements made with flow probes, and some devices may lose acoustic or electromagnetic contact, making any measurement impossible. Despite these problems, a number of technologies have been used successfully to measure blood pressure or flow during CPR."

Source: [Utstein-Style Guidelines for Uniform Reporting of Laboratory CPR Research](#)

This begs the question, with respect to the raw data and studies that Dr. Woerlee used to construct his graphs, what method of blood pressure measurements were used and were they all the same? If Dr. Woerlee combined data where different measurement methods were used, then his graphs are faulty. Keep in mind that some of the studies Dr. Woerlee cited are from the 1960's. Did they even have the proper measurement devices back then to avoid the measurement problems noted above?

3. Dr. Woerlee fails to mention that more than just blood flow is needed for a patient to be awake. There is a whole metabolic process that starts to breakdown immediately during cardiac arrest, which is quite an insult to the brain. That is why it usually takes time for patients to awaken after successful resuscitation which varies based on the length of CPR.
4. Using the data from his graphs, Dr. Woerlee concludes that the AWARE study results will be predictable. He states the following:

"These figures also predict that the AWARE study will also find that about 15-20% of cardiac arrest survivors will report being partially or fully conscious during cardiac resuscitation for cardiac arrest."

Let's break down what he is saying using his own citations. He is claiming the following:

- a. 15-20% of cardiac arrest survivors in the AWARE study will report and NDE.
- b. All of the 15-20% will have undergone chest compressions as a part of their resuscitation efforts and not defibrillation alone.
- c. All of the 15-20% will have undergone chest compressions efficient enough to provide adequate brain blood flow to support consciousness. Remember, even in his own questionable data, he concludes that CPR is only efficient enough to provide adequate blood flow for consciousness 18% of the time.

According to Dr. Woerlee's explanations, all of the above conditions will occur and overlap in all patients who experience NDE's. This seems like quite a leap of faith to me.

Dr. Woerlee then directs the reader to another article link which points to his website, ([Near Death Experiences in Survivors of Cardiac Arrest](#)). This article repeats a lot of the same information contained in his rebuttal to Dr. Long's research. However, I felt there were a couple of sections worth further discussion.

Under the section titled "Chance of consciousness during cardiac massage", Dr. Woerlee states the following: *"Minimum flow of blood needed to sustain consciousness is 15/ml/100 grams brain tissue/minute."*

I would point out the following:

1. He did not give a source for his data. Where did it come from?
2. All of the studies that I found indicate that at or below 15ml/100 Cerebral Blood Flow (CBF), the EEG would be Isoelectric (Flatline). Even at levels slightly above 15ml/100, the brain function is severely impaired. I even found a paper authored by Dr. Woerlee himself which seems to contradict his claim above. In his own paper ([Anesthesia things they never taught you at med school](#)), he indicates that at 31ml/100 CBF, cerebral ischemia is taking place to the extent that the patient suffers from confusion and is unable to carry out simple commands. Yet he claims that only 15ml/100 CBF is needed for consciousness. Even if someone were clinging to consciousness at this level, would you expect them to be able to experience and recall a clear and vivid NDE?

Sources:

http://Woerlees_Paper/hypotension.php

<http://www.02demand.com/cerebralbloodflow>

http://en.wikipedia.org/wiki/Cerebral_blood_flow#cite_note-Orlando_Regional_Healthcare-1

<http://books.google.com/books?id=tndqYGPHQdEC&pg>

<http://www.cognitivecontortions.com/Documents/Handout.pdf>

Also under the section titled "Chance of consciousness during cardiac massage", Dr. Woerlee claims the following: *"In general, consciousness is possible when the mean arterial blood pressure is equal to, or greater than 40 mmHg. A review of several studies of blood pressures measured during external cardiac massage applied during cardiac arrest reveals that around 17% of people have blood pressures capable of sustaining consciousness (the interested reader can click on the links to download and read the original medical articles - [Paradis 1989](#), [Swenson 1988](#), [Gurewich 1961](#), [Wei 2006](#))."*

I offer the following concerns:

1. The Paradis 1989 study involved the use of a mechanical chest compression device called a Thumper. This device is placed around the patient's chest and performs the chest compression using a piston/plunger. The Thumper allows for a consistent compression depth and compression rate. This consistency is not present with human CPR givers. One of the well known problems with CPR efficiency is the care-givers inability to compress far enough and/or sustain a rate conducive to adequate blood flow. Therefore, this study should not be included in his data unless he's suggesting that the Thumper was used in all NDE cases. The author of the Paridis study also warns of the following: *"Because we have measured only pressures, direct conclusions about blood flow must also be limited. As stated above, the Ao-JVB gradient is the maximum potential for cerebral perfusion, not the actual cerebral perfusion pressure."*
2. The Swenson 1988 study as noted previously, was performed on patients that were already deceased. Acidosis and other metabolic changes had taken place due to the death process.
3. The Gurewich study was from 1961 and the reported data was from a single patient. The blood pressure measured was from a catheter that had been withdrawn to the abdominal aorta. The measurements obtained were not predictive of blood flow to the brain.
4. The Wie study focused on the comparison of chest compression efficiency between patients in a prone versus supine position. It again was conducted on patients that were already deceased.
5. None of these studies attempted to measure patient consciousness during CPR.

6. Dr. Woerlee's own paper ([Anesthesia things they never taught you at med school](#)), indicates a slowing of EEG frequencies when the Mean Arterial Pressure (MAP) is between 20-50mmg. What state of consciousness could be expected with the slowing of these EEG frequencies?

Dr. Woerlee then attempts to tie the NDE experience to oxygen starvation of the brain. He seems to focus on the "clear state of mind" that is reported during NDE's. He writes the following:

"Even so, brain oxygen starvation does modulate the brain function of these people, and brain oxygen starvation has long been known to induce a fantastic state of mind."

He then quotes the following excerpt from a 1963 study:

"Hypoxia quickly affects the higher centers, causing a blunting of the finer sensibilities and a loss of sense of judgment and of self criticism. The subject feels, however, that his mind is not only quite clear but unusually keen. He develops a fixity of purpose and continues to do what he was doing when hypoxia first began to affect him, in spite of the fact that it may lead to disaster. This fixity of purpose is highly dangerous, especially when such an individual is responsible for the lives or others, such as is true of an airplane pilot."

My Critique:

1. The experience reported in his excerpt does not resemble the experiences reported by people who have NDE's. Dr. Woerlee has access to thousands of NDE accounts and should read what people are actually reporting before making such a faulty comparison.

2. Out of body

Dr. Woerlee spent a great deal of time in this section attempting to debunk OBE's by referring to his own opinions made during an imaginary conversation he had with a friend named Thomas. This imaginary conversation was the basis for his book "The Unholy Legacy of Abraham." He refers to this book several times during his rebuttal. The book is free and can be found here: [The Unholy Legacy of Abraham](#)

My Critique:

1. Unfortunately, the imaginary friend Thomas apparently had no knowledge of the many scientific studies that have been conducted in the area of OBE's and NDE's. Therefore, Thomas never mounted any kind of informed or substantive debate. Dr. Woerlee's book would have been a lot more convincing if it had been a real-life debate with a real person who was familiar with the subject at hand. It is very easy to win a debate when you get to make up the questions and your debater.

2. Why did he not look at actual OBE research that has been conducted by scientists? Had he done that, he would have realized that many of his explanations have been explored and either supported or disproven.
3. He often refers back to his own published opinions from his book "The Unholy Legacy of Abraham." The book is loaded full of circular reasoning such as:
 - a. *"After all, if dreams are a product of the continued activity of the soul as the body sleeps, then something really awful is happening to the soul in such a dream, or the dream is a very imperfect memory of events undergone by the soul in some unseen immaterial universe while you sleep"*
 - b. *"In other words you do agree that an unconscious person can have no conscious experiences"*
 - c. *"This means you do understand that conscious experiences can only be undergone by conscious people."*

Does Dr. Woerlee not realize that the definition of "consciousness" is at the heart of the whole NDE debate? He seeks to disprove NDE's by using the current physical definition of consciousness.

4. Many of his studies are from the 1960's. Perhaps this is just a coincidence, but considering the advancements in medical science over the past 40 years, wouldn't it make more sense to quote newer studies?
5. Also in the "Out of Body" rebuttal section, Dr. Woerlee states the following: *"But an immaterial consciousness cannot see and hear, which means that people undergoing out of body experiences hear with their ears, see with their eyes, and build images of all that occurs within their minds. But how can this be? Let us return to the basic properties of the out of body experience. An out of body experience is indisputably a conscious experience."*

Again, he is attempting to use the current physical definition of consciousness to make his argument. He seems to forget that people who report NDE's describe an altered state of consciousness which doesn't seem to follow the current physical model.

3. Blind Sight

Dr. Woerlee went to great lengths in this section to explain how blind people can have visual experiences during NDE's. He cites research such as (Bertolo 2003), which demonstrates that blind people can develop mental imagery based on their other senses and even draw accurate pictures representing this imagery. Therefore, he concludes that there is no mystery behind visual experiences during NDE's of the blind.

My Critique:

1. Dr. Woerlee fails to explain accounts where blind people were able to accurately describe the visual characteristics of what was going on during their NDE. Such as clothes that people were wearing, instruments being used, sequence of procedures, etc...
2. Take a look at the following research article ([Visual Dreams of Blind and Their Implications](#)) and notice how careful they are to explain that imagery formation of the blind is based on sensory perception and not to be interpreted the same as visual imagery. For example the following is an excerpt from the article that I note above:

"What do they mean when they said they "saw" something? One of the participants in Hall's study (1948), described objects with the highly visual terms, "pretty" or "beautiful," and later explained that the term "pretty" and "beautiful are purely tactual sensations. Also a participant in Kerr's study explained this phenomenon more clearly after giving a very vivid description of a control board with screens and buttons: "I guess I imagined the board with the buttons. ... it was not that I could really see them with my eyes, but I know what that board looks like, and the only reason I know what it looks like is by touch, and I could remember where the buttons were without touching them on the boards..." (Kerr, 1982) This implies that when they report they saw something, it does not have to mean they perceived it visually, but it's metaphorically visible for them since they know the target of stimulation is there.

When you compare and contrast this description with those reported during the NDE's of the blind, you can easily discern the difference. Descriptions from blind people during NDE's often describe things that the subject has never seen, touched or sensed in any other way. Dr. Woerlee would be better off debating whether or not these accounts can be verified, instead of trying to explain them away with faulty reasoning.

4. Impossibly Conscious

Dr. Woerlee dedicates this section to explain how patients can experience some form of awareness during general anesthesia. He starts out this section by stating his credentials: *"I am a physician specialized in anesthesiology. 2010 is my thirtieth year as a specialist anesthesiologist. I have a full time clinical practice at a medium sized general hospital, have written three textbooks on anesthesiology, maintain a teaching website on anesthesiology ([click here to see the website](#)), and am also an associate professor at the Leiden University Medical Centre."*

Dr. Woerlee then states than About 1:1,000 to 0.5:10,000 people experience some form of awareness during modern general anesthesia. He further directs the readers to visit a link to read an extensive discussion on awareness and paranormal phenomena during general anesthesia. The link refers back to an article that he authored.

My critique:

1. Dr. Woerlee attempts to group NDE's during anesthesia and "Awareness during anesthesia" into the same camp. Yet, if you research the many reports of patients who have experienced awareness during anesthesia, you quickly find that their experiences do not resemble NDE's. In fact, the following is what Dr. Woerlee did not tell us; According to (N. Moerman et al., *Anesthesiology*; 79:454-464, 1993), if anesthesia awareness does occur, about 42% feel the pain of the operation, 94% experience panic/anxiety and 70% experience lasting psychological symptoms. There is a network of support groups and awareness websites that are pushing for solutions to this serious problem.

A large number of people who have experienced anesthesia awareness have been diagnosed with Post Traumatic Stress Disorder. How could Dr. Woerlee make this comparison!

5. Perfect Playback

Dr. Woerlee offers no real scientific rebuttal in this section. He simply concludes that the life review fails to provide any proof of the afterlife.

6. Perfect Playback

Dr. Woerlee offers no real scientific rebuttal in this section either. He simply concludes that visions of deceased family members during near death experiences are not positive evidence of the afterlife.

7. From the mouths of babes

In this section, Dr. Woerlee bases his explanations on the simple premise that since all human bodies are the same, then experiences in children would be the same as those in adults.

My critique:

1. Since Dr. Woerlee has not proven that the NDE is purely a physical body process, his conclusion in this section is speculation.
2. Others might argue that if the "Soul" exists, then it would logically follow that the process of the soul separating from the body would be similar. That of course has not been proven either.

8. Worldwide Consistency

Much like Section-7, Dr. Woerlee spends an exhaustive amount of time arguing that all human bodies are the same and will therefore have similar NDE elements.

My critique (Same as Section-7):

1. Since Dr. Woerlee has not proven that the NDE is purely a physical body process, his conclusion in this section is speculation.
2. Others might argue that if the "Soul" exists, then it would logically follow that the process of the soul separating from the body would be similar. That of course has not been proven either.

9. Changed Lives

In this final section, Dr. Woerlee accuses Dr. Long of failing to mention possible alternative explanations for transformative changes after NDE's. He offers oxygen starvation as an explanation for these transformative changes.

My critique:

1. It takes only a little bit of research to discover the long term effects of oxygen starvation in humans. None of these effects seem consistent with the changes noted from people who experience NDE's. For example, the following is an excerpt from this article: ([Hypoxic-Anoxic Brain Injury](#))

"Even when a person has fully recovered consciousness, he or she might suffer from a long list of symptoms. In many ways, these symptoms are similar to those commonly seen after a blow to the head. The effects can vary widely depending upon the part of the brain that has been injured and the extent of the damage. Some of the major cognitive (thought) problems are:

- *Short-term memory loss. This is the most common cognitive symptom, especially among those who have HII. The reason is that the part of the brain that is believed to be responsible for learning new information, called the hippocampus, has neurons that are highly sensitive to oxygen deprivation.*
- *Decline in executive functions. Disruption of such critical tasks as reasoning, making judgments, and synthesizing information. This can lead to impulsive behavior, poor decision-making, inability to direct, divide, or switch attention.*
- *Difficulty with words, also known as anomia. These linguistic problems include not being able to remember the right word, selecting the wrong word, confusing similar words, not understanding commonly used words, and so on.*
- *Visual disturbances. Difficulty processing visual information can occur in some cases. One rare disorder is called cortical blindness, in which the area of the brain responsible for vision becomes disconnected from the rest of the brain. Because the brain cannot tell that this part is damaged, people may appear to act as though they can see even though they display no ability to identify or recognize objects, shapes or colors."*

There is plentiful research showing the typical personality changes following oxygen starvation to the brain. I could not find any that correlate with the transformations noted in NDE patients. More examples:

[Personality Changes From Mini Strokes](#)

[What Happens During a Stroke](#)

[Anoxic Brain Injury](#)

[Cerebral hypoxia](#)

Summary

When I first began reading Dr. Woerlee's writings regarding NDE's, I actually had high hopes that he was actually taking a scientific approach toward explaining the NDE. However, my hopes quickly faded as I realized that he had failed to take a close enough look at the very same NDE research he was critiquing. Had he done so, perhaps he would have realized that a lot of his explanations simply do not fit.