



# **Into the Gray Zone: A Neuroscientist Explores the Border Between Life and Death**

*Adrian Owen*

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## **Into the Gray Zone: A Neuroscientist Explores the Border Between Life and Death** Adrian Owen

In this startling and thought-provoking book, which will remind readers of works by Oliver Sacks and Atul Gawande, a world-renowned neuroscientist reveals his controversial, groundbreaking work with patients whose brains were previously thought vegetative or non-responsive but turn out—in up to 20 percent of cases—to be vibrantly alive, existing in the “Gray Zone.”

*Into the Gray Zone* takes readers to the edge of a dazzling, humbling frontier in our understanding of the brain: the so-called “gray zone” between full consciousness and brain death. People in this middle place have sustained traumatic brain injuries or are the victims of stroke or degenerative diseases, such as Alzheimer’s and Parkinson’s. Many are oblivious to the outside world, and their doctors believe they are incapable of thought. But a sizeable number are experiencing something different: intact minds adrift deep within damaged brains and bodies. An expert in the field, Adrian Owen led a team that, in 2006, discovered this lost population and made medical history. Scientists, physicians, and philosophers have only just begun to grapple with the implications.

Following Owen’s journey of exciting medical discovery, *Into the Gray Zone* asks some tough and terrifying questions, such as: What is life like for these patients? What can their families and friends do to help them? What are the ethical implications for religious organizations, politicians, the Right to Die movement, and even insurers? And perhaps most intriguing of all: in defining what a life worth living is, are we too concerned with the physical and not giving enough emphasis to the power of thought? What, truly, defines a satisfying life?

This book is about the difference between a brain and a mind, a body and a person. It is about what these fascinating borderlands between life and death have taught us about being human.

## **Into the Gray Zone: A Neuroscientist Explores the Border Between Life and Death** **Details**

Date : Published June 20th 2017 by Scribner

ISBN : 9781501135200

Author : Adrian Owen

Format : Hardcover 320 pages

Genre : Nonfiction, Science, Medical, Audiobook, Psychology, Health, Medicine, Biology, Neuroscience

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# **From Reader Review Into the Gray Zone: A Neuroscientist Explores the Border Between Life and Death for online ebook**

## **Sandie Buto says**

It is so rare that a book comes along that sparks my interest and intellect (such that it is!) like this one. I have found myself quoting parts to friends, taking pics of pages and sending them off, and pondering who I will bless with a copy. The book is so accessible and is presented very well, interspersed with enough human examples to make it hard to put down (such a well worn phrase but certainly applies in this case). The author is also clearly empathetic to the plight of his experimental “subjects” and the families who believe in their loved ones consciousness and responsiveness despite evidence to the contrary. I am sure that part of my intrigue is that I worked freshly out of college and many years ago in a brain injury rehabilitation center, doing both therapy and admission work. If the current technology had been available, what a difference it would have made in many lives and given answers and peace to tortured families. We saw very little miraculous recoveries but yet the hope of family members was inspiring and devastating at the same time. Using the methods of communication that Owen presents, what are the ethics of using the results to determine admission to a very expensive rehab center to improve odds of serving only those with “potential”? An interesting thought....

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## **Carolyn says**

I really enjoyed this, I just thought it was about the “crossing over” period, not the mental states of vegetative persons.

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## **Alyson says**

This is a very comprehensive report on a fascinating and terrifying subject that is very well researched and told in a completely approachable manner. Narrator Steve West should be commended for his talent in the audiobook version. Huge science went into this book, and yet humanity and caring, really caring about people and their lives, their existence on earth, is what comes across most. Oliver Sacks and his books came to my mind while listening to this audiobook. Questions are answered here, yet we are left with many more at the conclusion. This is an eye opening look at consciousness that leaves any reader only hoping that pulling the plug on a loved one never becomes a decision that needs to be made in this lifetime. And living wills will be more difficult to resolve as well. Yikes.

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## **Cathy says**

I really enjoyed reading the details about scanning of the brain and how different tests measure certain areas. I am hopeful that technology will help those deemed to be in a vegetative state and if it helps support staff, nurses and doctors treat people more humanely while in that state, then more power to it! The author did admit there is so much we do not know but I just felt that the book finished on a trippy note. Kind of like 'we smart humans will conquer and solve the mystery of the brain!' Maybe it's the 'science replacing God'

attitude that I cannot appreciate. I don't know, but it's a very interesting book.

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### **Patricia says**

Into the Gray Zone by Adrian Owen is about his journey as a neuroscientist looking for indications of consciousness in patients typically diagnosed as being in a persistent vegetative state, the "gray zone". The book step-wise takes us along for the ride, as Dr. Owen works with increasingly better technology, and then works with his research team and colleagues to use that technology in a smarter and smarter way, since time analyzing gray zone patients is precious in more ways than one. We also get to know the patients and importantly their loved ones. The book tackles questions such as "What is consciousness?", "How and when does consciousness arise?", and "How can you possibly recognize consciousness in a patient in the gray zone?". The book also addresses how communication might be established if consciousness is discovered. The story is well-constructed and also leaves the reader pondering even bigger questions such as the impact to society of direct brain-computer communication technology potentially being commonly used in the future. A great read!

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### **Laura says**

An incredibly detailed and fascinating insight into the world of patients in vegetative states of mind and how the author and a team of specialists seemingly discovered a way to communicate with them. The idea that vegetative patients experience a degree of consciousness is remarkable; it helps that this book was very well written with the non medic in mind.

The area of neuropsychiatric care is massive and seems to go on forever. The author gives thorough consideration to readers unfamiliar with biology and the wider sciences; and of course for every theory, test and scan there is a patient story behind it. There are some really intriguing stories to be told here and I'm sure there were many more the author couldn't fit in to his book.

A must read for those interested in psychology, psychiatry and the neurosciences.

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### **John Martindale says**

This book is the fascinating story of how a scientist was able to discover and prove that some individuals in vegetative states are in fact conscious, aware of their environment, and the passing of time, though they are completely unable to use their body to convey this to others. It is sobering to consider, and I liked how the author reflected upon the implications of it. As the book closes, he leaves one hopeful that as science continues to advance, more ways should open up for those in comas to be able to communicate and begin to function again with those in the land of the living.

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### **Darlene says**

This book, Into the Gray Zone: A Neuroscientist Explores the Border Between Life and Death by Adrian

Owen piqued my interest because I have thought a great deal about just what it means to be conscious. Every now and then, we see stories in the media of people who have been in a vegetative state for years. The case of Terri Schiavo comes to mind immediately, mainly because of the very public legal battle which took place. I can't help but consider and attempt to imagine what being in that state feels like. What DOES it mean to be conscious? In its simplest definition, consciousness is described as "having an awareness" and being "able to feel and think". In this fascinating book, Adrian Owen, through his incredible research, inspires readers to examine what it means to be conscious and whites the difference between a brain and a mind? His research with patients in a vegetative state raises questions about our widely held definition of consciousness.

Adrian Owen is a neuroscientist who has been working for decades with patients who have been described as being in a vegetative state or non-responsive due to brain injuries or degenerative diseases such as Alzheimer's. What he believes he has discovered is not without controversy; nevertheless, through his research and experimentation, he has found that in about 20% of cases the patients are actually in a space between full consciousness and brain death.. a space he calls the 'gray zone.' These patients often seem oblivious to the world around them and are viewed by medical professionals as being incapable of thought. Dr. Owen strongly disagrees. He believes that their "intact minds are adrift deep within damaged brains and bodies." And he set out to prove just that...

This book is not at all daunting to read. It is not filled with medical jargon or written in the language of a professional journal article. And lest you think that Dr. Owen writes only of his successes, he also documents his frustrations and failures. Through years of trial and error and with the fortunate advancement in technology, Dr. Owen pioneered a new technique using fMRI machines (functional magnetic resonance imaging) to attempt to assess brain function. To help the reader understand exactly how the process worked, he presented a number of case studies. Initially, he pulled together a control group of healthy people and came up with an interesting way to elicit the same responses in the brains of all of his subjects. He needed something which would 'light up' the same areas in all brains being tested. He and his team brainstormed and they thought of two scenarios: in the first scenario, the subjects were asked to think about and imagine playing the game of tennis. Using the fMRI, Dr. Owen was able to see that when his subjects thought about playing tennis, the part of the brain which is situated near the top of the head (which is known as the premotor cortex) lit up every time. The second scenario he used with his healthy subjects was to ask them to imagine or visualize themselves walking through their homes. This time, the part of the brain associated with spacial memory 'lit up' in each subject.

Taking the information he collected using his healthy subjects, Dr. Owen was prepared to attempt the experiment with patients in a vegetative state. Dr. Owen needed to be able to demonstrate that just as in healthy people, he could use the fMRI machine on damaged brains to "catch them in the act of making a willful decision." A number of his patient case studies have stuck in my mind... The first patient he tried the technique on was named Carol. Carol was a 23-year-old woman who had been hit by two cars as she attempted to cross a busy street and while she was distracted by her cellphone. She had been in a vegetative state for months. Placing her under the scanner, Dr. Owen asked her to imagine she was playing tennis. He then asked her to imagine she was walking around her home; and to his surprise and delight, the premotor cortex and the spatial memory parts of her brain 'lit up' ... just as they had in his healthy subjects.

To carry the experiment one step further and in an attempt to communicate with a patient, Dr. Owen and his team devised a list of questions to ask the patient and would instruct the patient to imagine playing the game of tennis to signal a 'yes' response'; and to imagine walking through his hometown signal a 'no' response. Dr. Owen attempted this experiment with a patient named Scott, a man who had been in a vegetative state for the 12 years since he had been involved in an automobile accident. Scott was presented with clear 'yes' or 'no'

questions.... "Are you in any pain?" and "Do any of your body parts hurt right now?" are examples of questions used in Scott's case. Scott was instructed to imagine playing the game of tennis if his answer was 'yes' and to imagine walking through his home if his answer was 'no' . The spatial memory part of Scott's brain 'lit up', signaling to Dr. Owen that he was not in any pain.

Are these successful experiments proof that a 'gray zone' does exist in some patients who have been considered non-responsive by the medical community? I found the case studies presented in this book to be exciting and promising; but Dr. Owen has been criticized by others in his field. Some of his detractors believe he is reading too much into the data he has collected and is providing false hope to patients and families who have already been traumatized. Dr. Owen believes that at the very least, his findings have encouraged doctors, nurse and family members to view these patients with more empathy and this empathy may increase the likelihood of a partial recovery.

I personally feel this breakthrough his exciting. But I also have to admit that the case studies provided were also disturbing to me. For so long, medical professionals have believed that they could say, with a degree of certainty, that patients in a vegetative state were not conscious or aware of their surroundings. Dr. Owen's research makes it clear that thinking of these patients as unresponsive is far from certain in at least 20% of the cases. As I often do when reading these types of books, I attempted to imagine how these patients must feel being essentially trapped inside of their own bodies. That reminded me of the age old fear of being buried alive.. and that's an awful thought! I also feel that Dr. Owen's research presents moral, ethical and legal challenges and because of this, society will be forced to try to answer some very difficult and important questions... what makes a life valuable or worth living? What IS the difference between a brain and a mind? And what does it mean to be conscious? Plenty of food for thought....

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## **Jeanette says**

This book is well worth the read. The author cleverly tells his own progressive career path and life story, surprisingly revealing much about himself and his feelings beyond the science.

And the science is interesting and the brain scanning for those who are deemed or may be in "the gray zone" the core of what this book describes. The neuroscience of the operating brain and especially within those who are in coma, unconscious and all the intermittent layers of possible in between and scaled for "activity".

It's scary and absolutely ominous that in the past, like in burial habits- that there has been strong assumptions upon those with no reactions as being close to death or unaware, which have been entirely wrong.

He gets into tangents of history and specific cases which were very illustrative. Perhaps I wanted to hear more about possible optimum treatment? Regardless, it has made me think about powers of attorney to a greater degree that the one I hold/ have. And also when around the unconscious and non-responsive I would and will always talk to them by name and declare in each detail exactly what/where and how touch or sound or involvement is occurring.

The mapping of the brain as this author surveys consistently- that is very difficult work. He explains the white matter well here. Better than most in his field for sure. But I would have liked more about the scanning maps and less about his constantly moving and job/ tenure/ traveling details. The last sections which contained his thought summations upon the possible future in this field - 2 stars.

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## Mary says

Into the Gray Zone is a scientific quest to discover and learn about the territory of the mind and the brain. What happens to people that are in a coma? Are they aware of their surroundings? Do they still have memories or likes and dislikes? Or do they float without thought through a dark void?

This book follows a series of clever and evolving tests designed to answer these and other questions. For example, a comatose patient has his or her brain activity monitored and is asked to imagine playing tennis. If the person is conscious, this lights up activity in a certain part of the brain. Then he or she is asked to imagine walking through the rooms of their home. Again, if the patient is conscious, a different area of the brain shows a spike in activity. Then the scientists move to using these two scenarios to serve as yes and no and ask the comatose patient simple questions.

If you are interested in science, you will find this book a fascinating read and enjoy learning about how these experiments continue to evolve and where they might lead in the future.

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## Essam Munir says

This is the voice of those who lost it!

Vegetative state in itself is an interesting and painful condition for everyone (the family and physicians).

This book and the stroke of my insight are the books that need to be read by physicians to get insight to the workings of the brain of those who suffered this.

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## Caidyn (SEMI-HIATUS; BW Reviews; he/him/his) says

*This review and others can be found on BW Book Reviews.*

The gray zone. A thing that no one has really heard of but everyone would know once they hear me say "vegetative state". That's what the gray zone is. People who are somewhat responsive or completely non-responsive to the world around them. It's something most people are familiar with, the topic that sparks so many debates about the right to life or the right to die with dignity. It's a really hot topic.

Adrian Owen is a neuroscientist whose research focuses on the people in the gray zone. Mainly, his research focuses on how to bring people out and how to know whether people are conscious of what's going around. It's a huge topic. Do these people know what's going on or are they completely gone? Dr. Owen takes this topic, his whole life's research, and tries to condense it into something that's understandable.

The only experience I have with consciousness is a very short lecture that a classmate did for an honor's project in my behavioral neuroscience course. Everything went above my head. Consciousness is a difficult concept since it takes multiple forms. We can be aware of our surroundings, but we may not understand ourselves or be able to introspect. Emotions may not show consciousness since dogs show emotions, yet do they have the power to introspect or form complex mental maps of words, topics, or relationships.



Dr. Owen explains all things related to consciousness perfectly. He makes it easy despite having the ability to go way above everyone's heads to reach academics who, like him, spend their lives researching it. He's come into contact with doctors, psychologists, fellow neuroscientists, and philosophers.

This conversation has touched most people in some way. Having to make a choice about a relative or a friend doing the same. Debating something like this in a class. However, this book gives a very unique spin on it by looking at his research that examined people who came out of the gray zone and recovered their abilities.

While this book is definitely specialized and I read it because I find psychological topics fascinating -- and I'm half tempted to suggest it to my advisor since he loves biological psychology -- it's incredibly accessible. You don't have to have any past knowledge on this to enjoy it.

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### **Laurie's Lit Picks says**

Admittedly, non-fiction books about anything medical seem to be a siren song for me; I find them boundless fascinating. Having read and loved *Being Mortal*, *The Remedy*, and *My Own Country*, I was immediately drawn to this one. Adrian Owen, a neuroscientist, embarked into a career to explore, learn, and hopefully discover what occurs in a patient's brain when diagnosed as being in a 'vegetative state.' Throughout the book, he intersperses real life patient stories, discussions of his own personal life and experiences with the medical world, as well as the head injury of the woman he once loved. I found his patient stories the most fascinating, with many "wow" moments as more and more of the gray zone was opened up to Owens and his fellow scientists, as both technology and learning progress continued to expand. At times, the medical-ese stumped me and got a bit dry, but Owens was able to jump back into a narrative pace that helped bring the story alive to someone like me, fascinated with medicine but a complete dunce when it comes to the science of it all. For those people who are impacted by a brain trauma, who work with children or adults with brain injuries, or for those other people like me who are just suckers for a good medical mystery, this book is a great choice.

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### **Cheryl says**

Adrian Owen is a world renowned neuroscientist who has conducted research involving cognitive abilities in people with traumatic brain injuries.

In his newly published book, *Into the Gray Zone*, Owen writes about the cutting edge procedures he and his colleagues have developed in order to try to establish whether or not patients who have been diagnosed as being in a persistent vegetative state are, in fact, cognizant of their surroundings.

Although some parts of the book are difficult to comprehend, Owen successfully explains in layman's terms, how the injuries sustained by patients impact various parts of the brain, and what long term consequences they produce.

Each chapter details the experiences Owen has encountered while working with specific patients and their families. Each person experienced a sudden, unexpected brain injury that left them trapped inside their body with no way to communicate their thoughts! The damage sustained by their brains has placed them in the

"gray zone"-- somewhere between life and death. Each story is heartbreaking. Yet Adrian Owen is optimistic that advances in brain research and technology will someday provide better outcomes for people with traumatic brain injuries.

I would give this book more stars if I could. It is one of the most interesting and informative books I have ever read. Thank goodness for these intelligent, dedicated researchers whose goal is to help people when others have simply given up on them. I was moved by Adrian Owen's comment about his research: "Beyond the elegant experiments and dazzling technology, the heart of gray-zone science is about finding people who have been lost to us and reconnecting them with the people they love and who love them. Each contact still feels like a miracle.....What began as a scientific journey more than twenty years ago, a quest to unlock the mysteries of the human brain, evolved over time into a different kind of journey altogether: a quest to pull people out of the void, to ferry them back from the gray zone, so they can once again take their place among us in the land of the living."

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### **Bonnye Reed says**

GNab I received a free electronic copy of this book from Netgalley, Adrian Owen, and Scribner in exchange for an honest review. Thank you all, for sharing your hard work with me.

Adrian Owen outlines and details his work with patients suffering neurological damage due to accident or illness over the last 29 years, the equipment and processes used to recognize consciousness in those persons diagnosed as being in a vegetative state. This was a hard book to read. In our world we get used to happily-ever-after. We see it in our books and our films, those adult fairy tales that carry the day.

Every inch of progress made in neuroscience was hard fought on several fronts - general perception, funding, equipment. But these scientists have climbed those unknown mountains, and found many positives for those suffering injury, Parkinson's or Alzheimers, and found new ways to communicate with people in the Grey Zone. What a wonderful breakthrough!

pub date June 20, 2017  
Scribner

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