

TRAUMATIC BRAIN INJURY AND NEURO-OPTOMETRY  
Review of The Ghost In My Brain, by Clark Elliot, Ph.D. and Comments  
By David G. Schwartz, M.D. April 28, 2017

Millions of traumatic brain injuries are reported each year in the U.S., and many people have long lasting brain dysfunction. They are often misunderstood and feel left out of the health care system and are often told that nothing can help them recover. For many, they feel isolated and estranged even from themselves, since an important part of the identity is gone when many cognitive functions are lost, and sometimes the person feels as though he or she has died or is alien or nonhuman. This is what Dr. Elliot experienced after his car accident, for years afterward, until he discovered the behavioral optometry rehabilitation program that turned his life around to have nearly normal brain function now.

It is startling to read about how it took him an hour to walk from the parking lot forty feet to his house and to get the key into the door, 2 days to decide whether to slice the salami or the apple first, getting drastically hungry all the while. He finally phoned his friend to decide for him and tell him which to slice first, and then he could go ahead cut the salami first. He could understand the issues involved in making the choice, but could not make the decision or initiate the action. He would lose balance and be unable to walk, from brain fatigue after doing what for him was a complex task that used up his brain energy, such as getting on and off the subway.

He describes the many functions of the brain that for most of us operate like a finely tuned orchestra, however much more complex than that. For a post concussion person, the brain has to work extra hard to do simple tasks, is much less efficient, and tires easily. In many cases, brain dysfunction or obsessive-compulsive disorder may have resulted from an unrecognized concussion in the past, a bump on the head that was forgotten. We used to diagnose concussion on the basis of whether the person blacked out or not at the time of injury, but now we find that many people have brain dysfunction from a blow to the head with no loss of consciousness. This may broaden the definition of concussion, meaning any injury to the brain substance itself from a shock or vibration. It is of concern that children and adults are often exposed to head trauma with contact sports, especially football and with heading the ball in soccer. We may have to take more care to protect against these bumps to the head that do not cause loss of consciousness.

This book describes a treatment that works with visual networks in the brain that help to form new circuits and pathways and encourage regeneration of synapses and neurons, long after the initial injury. Most of the sensory input to the brain is from the eyes. The optic “nerve” is actually the optic tract, a part of the brain structure itself, so it stands to reason that working with the visual system could affect brain function. Dr. Elliot describes his difficulties with brain function as involving vision and mentally visualizing actions, using visual symbols. Balance in particular needed visual input.

This treatment involving eyes and vision is relevant for long-term brain dysfunction, but what about acutely, shortly after the injury? What measures can be taken

immediately afterward help to make long-term problems less likely? Before discussing the treatments for long-term brain dysfunction, it would be reasonable to look at the short term.

These are some of the things I put together from various sources, not from Dr. Clark's book, most not proven, but they make sense since they are generally beneficial for physiologic and biochemical functions that affect the brain.

Avoid further injury, wear hardhat or reduce exposure. A second concussion soon after the first could be fatal. Rest, sleep, manage stress, do mild exercise. Avoid big vibrations. Avoid mentally challenging activities until improved. Keep screen time down to approx. one hour/day or less (computers, TV, videos, smart-phones, tablets, email, Facebook, etc.)

Antioxidant support: Vitamin C to bowel tolerance (liposomal preferred). High potency B-complex, Vitamin E (mixed tocopherols), Bioflavonoids, grape seed extract, resveratrol, blueberries, blackberries. After an injury, tissues undergo oxidative stress, and these nutrients can reduce the free radicals that oxidize tissues.

Reduce inflammation: Bromelain high potency and other enzymes digestive enzymes, pancreatic enzymes or vegetarian enzymes 3x/day between meals. Turmeric with black pepper, ginger, high dose fish oil. Astragalus, Echinacea. A significant part of brain dysfunction may be due to activation of the glial cells in the brain, immune cells that get activated and cause inflammation.

Gut health: Mostly vegetables, no processed food. Probiotics. If digestive system is imbalanced, unfriendly bacteria can produce toxins that go to the brain. The gut and the brain are closely connected neurologically. See neurologist Dr. David Perlmutter's book, Brain Maker. Low glycemic, near ketogenic diet. Check for gluten sensitivity. If positive, avoid gluten.

Healing injured tissues: Centella asiatica (gotukola)

Brain nutrients and support: Coenzyme Q-10 (ubiquinol), n-acetyl cysteine (NAC), alpha lipoic acid, acetyl-L-carnitine, oat milky seed, inositol, choline, phosphatidyl choline (lecithin), phosphatidyl serine, lithium, vinpocetine, Bacopa monnieri, Lion's mane (*Herinius erinacius*). The last one can help new brain cells form. Many of these nutrients are applicable to a large number of neurological conditions, including Alzheimer's Disease. This is particularly relevant because of the increased incidence of Alzheimer's among people who have suffered concussions.

See a practitioner of functional medicine, or one who is well versed in natural treatments, who understands holistic medicine, botanical medicine, etc.

Regarding the long term dysfunction, Dr. Elliot describes in detail the various aspects of brain functions with which he had difficulty. Since he is a professor of artificial

intelligence and cognitive science, he portrays a fascinating but disturbing account of the details of his brain dysfunction. It causes the reader to have a greater appreciation of how magnificent our brains are, with the enormous complexity of functions, layer upon layer, which we often take for granted, and great empathy for people with this problem. The details get somewhat technical in certain sections, for a reader who is not familiar with a lot of the terms used in information technology.

The cognitive parts of the brain, in the neocortex, are the most susceptible to injury, and are also most amenable to treatment. They are more malleable, can be more easily reconfigured, and have more neuroplasticity. Many people with brain injury hide it very well, have designed ways of “faking” it.

Dr. Elliot took 1200 pages of notes describing his experience. This gave him an increased appreciation of how the brain works. He analyzed in slow motion the various complex layers of cognition. For example, it took him 2 1/2 minutes to go through the various sequential steps in the process of remembering his children’s names. All these functions happen with a normal brain in a fraction of a second.

He describes the brain’s capacity to store information as if we were to put every thing we remember on regular sheets of paper, the stack would extend into space and circle the earth 100 million times. To transmit everything in a human’s mental state with high speed internet, it would take several 100,000 times the current age of the universe.

The “Ghost” is a play on words regarding Rene Descartes’ phrase “the ghost in the machine,” in his concept of mind/body dualism. Dr. Elliot felt as though his true self was sent into exile the moment of the car crash, and he was an alien living among real humans. With the many people with concussions he has met over the years, it was a standard private joke, “Welcome to life in exile. Welcome to life among the non-humans.”

After many months of therapy, he felt his true self, “the ghost,” starting to appear. He first sensed it 30 feet behind him, then closer and closer, within a span of several weeks. Then one day he felt it finally merge with him, and he felt whole again, weeping with tears of joy.

His experience with the emergency room at the hospital a few days after his car crash, when he had been rear-ended, was appalling. He knew his name, but could not speak it. The doctor told him he had a bad concussion, to go home with printed instructions (He could not read.) to have someone wake him every few hours during the night. He was given a bottle of Vicodin, for what he did not know, he could not read the instructions, and he didn’t take them. It took him several hours to make it one mile to his house. They had left a catheter in his arm, and he did not understand what to do with it, and when it was painful and swollen, he returned to the ER. They removed the catheter, but the nurse and the rest of the staff were laughing at him for being so stupid.

Several weeks after the crash, he again called his family doctor and he was again told to go the emergency room. He reluctantly went. The staff was trying to determine if he was malingering because of such odd behavior. He didn't know what to do with the pills they gave him, and 45 minutes later, the nurse got impatient about him not taking the pills, spoke to him harshly, and so he left. After using up so much brain energy there, it took him ½ hour to figure out how to get to the garage and to find his car (ordinarily a 2 minute trip). He was so exhausted when he reached his car so he had to rest sitting in the car, waiting until it was safe to drive. (Usually when not exhausted he could drive a car because it was a routine task, not requiring new or complex behavior.) The security guard told him if he did not leave immediately, he would be arrested. He mustered enough energy to move his car to the street, and then he rested there. He was able to enter his house 3 hrs later. He vowed never to return to the hospital, and he never did.

When he finally saw a neurologist at the insistence of his family doctor, he made sure that he was well rested before the appointment so he could function better. He performed well on initial cognitive tests, then started to deteriorate, and his brain got fatigued, performed more poorly, and then could not even speak. The neurologist was not interested in what he did say to explain what was happening with him, but he performed a quick neurological exam and said, "You are fine." The neurological tests had no protocol for repeating the tests to notice deterioration with repetition. During the exam there was also no recognition of the deterioration of motor skills.

All the while during the ER visit and the neurological consultation, there was constant suspicion of malingering, because of the accident with potential for litigation. There seemed to be a "one size fits all," in terms of evaluating a person's neurological function. Since he didn't fit the mould, his odd behavior was not recognized as brain damage.

So Dr. Elliot asks, "What do many other people with concussion experience at the hands of the medical profession?" He, a highly intelligent professor, did not even understand what was wrong with him. How do others with fewer resources and less intelligence fare? I ask, how many incarcerated or homeless, often given psychiatric drugs, are mainly suffering the results of concussion? Granted, others often have less severe symptoms than Dr. Elliot, but any one of the problems he had would be enough to severely handicap a person.

Likewise, he encountered the ignorance, impatience, and lack of understanding in the general public, for example when he had to go to the grocery store. Because he took a long time in the checkout line and delayed using the credit card because the beeping sounds were deafening to him and caused great head pain, the man behind him slugged him in the shoulder in the parking lot. Then, in the parking lot he had to walk so slowly because of fatigue, the driver of a car who was waiting for him to get past the back of the car got impatient. She tried to ram him, causing him to use emergency reserves of energy to jump out of the way, to fall to the pavement, spilling his groceries. I wonder how many disabled people avoid going out in public for fear of abuse by impatient people in a hurry? If we saw more of these disabled people in public, maybe we would have more

understanding and flexibility, not expecting everyone to get out of our way immediately and to behave predictably. Granted, this was Chicago, and from my experience there in the 1970's, rudeness was not so surprising to me in large, northern cities.

Dr. Elliot describes in great detail the many components of cognition that are impaired. He would experience loss of balance following the cognitive load of thinking that entailed visualization, pattern matching, and spatial imagery to form analogies. The brain would grow fatigued, and then nausea. Navigation was difficult because of loss of distinction of where the body ends and the external world takes over. Listening to conversation used up visual system to understand, then the visual system could not be used for balance. Geometry lost structure. Directions, NSEW was lost. Dreaming uses up visualization, and could cause exhaustion, nausea, and disorientation, so sometimes he would have to keep his eyes open to keep from sleeping and dreaming, resting that way until he would have enough energy to dream. He found he could not meditate as he used to previously, and his prayers felt meaningless, whereas before, he could feel God listening. He lost his ability to understand time. Clocks and the world seemed to have no connection. In order to function he had to establish rules for routine, to eliminate the need for thinking complex thoughts. Once walking past a restaurant, the sign said, "Come In." He knew it was just a stupid sign to attract pedestrians, but he had to follow that rule, but he did not want to go in, so he was stuck. He asked his friend Jake to push him to get going, and then they could walk on. Listening to conversation was difficult if someone did not speak in clear precise descriptive language. Listening to his 3-year old daughter's incessant babbling drove him into a downward spiral of deterioration shortly before he got treatment.

He had physical effects like headache, muscle spasm, shaking uncontrollably from side to side. The daily discipline of forcing his legs to go, ignoring fatigue, strongly visualizing his goal, and persistence were activities shared by long distance runners. He found that with minimal training, he could run long distances, including marathons. He did 12 marathons during his 8 years of disability. The experience was like a normal day, to him. "Left foot, right foot, keep going!" Thus medical people would think he was malingering. "How could a marathon runner have disabling brain damage?"

Eight years Dr. Elliot suffered with this disability and all the while learned to adapt to it, to "fake it," and he maintained his work as professor and cared for his children, much of the time as a single parent. Eventually he ended up in a downward spiral of deterioration until he chanced upon Donalee Markus, Ph.D., a cognitive restructuring specialist, and Deborah Zelinsky, O.D., a neuro-developmental optometrist.

He began his therapy with Donalee Markus Jan 31, 2008, more than 8 years after the crash. She started with having him copy geometrical designs, which caused him to melt down, with uncoordinated movements, slurred speech, etc. Then with wearing aqua and purple sunglasses, his coordination and balance improved immediately.

Then her colleague Deborah Zelinsky did long testing and interview sessions, and fitted him with special glasses, some with prisms, some selecting light in central vision,

some in peripheral vision, some emphasizing left visual fields, some right. This would go on for months, with Phases 1, 2, 3, 4, 5, and 6 glasses, for different functions in each phase, according to the changes in his brain function. The most common way of evaluating visual function is central vision. Peripheral vision involves many “non-image-forming retinal pathways that link the external environment to internal systems that control sentience and metabolism,” according to Dr. Zelinsky. This is beneath conscious awareness and affects balance, posture, hormones, neurotransmitters, circadian rhythms, etc.

The research to support neuro-optometric rehabilitation goes back to the 1920’s and ‘30’s, and thousands of articles have been written on retinal circuitry, linking neuroscience and optometry. My question is why has this been hidden from health care? As with many unconventional methods, just because they don’t fit the common paradigms of rigid medical practice, they are either ignored or opposed.

Dr. Elliot describes the details of his long therapy involving the different eyeglasses and the geometric puzzles with dots and diagrams, with increasing difficulty and complexity. For the average reader this is highly technical and may be difficult to understand, but he describes the changes in his cognitive function, behavior, balance, hearing, etc., and the improvement of his ADD, which he had had before the accident. All this takes place one stage at a time over several months. He still wears phase 6 glasses at the time of writing of the book in 2015, and he is almost completely normal, even when not wearing the glasses. His brain has been “rewired.”

People who want to find optometrists who do this work can contact the College of Optometrists In Vision Development (COVD), [www.covd.org](http://www.covd.org). It can help people find developmental optometrists in their area. The providers usually have FOCD after the names. For our area, Insight Vision Therapy is in Charlottesville, VA, [insightvt@gmail.com](mailto:insightvt@gmail.com). Dr. Gregory J. O’Shanick, M.D., in Richmond, VA does some of the cognitive work in rehabilitation. He is director of the Center For Neuro-rehabilitation Service. The Optometric Extension Program Foundation, Inc. is also a good source of information, 949.250.8070, or [www.oepf.org](http://www.oepf.org). Another source is NORA, the Neuro-Optometric Rehabilitation Association. These treatments many times are not covered by insurance, and providers are restricted in the information they are allowed to publish, as with all of us who practice holistic medicine, a tribute to the FTC, the FDA, and the corporate pharmaceutical “mafia,” who try to limit the competition against conventional medicine, especially drugs.

As usual I usually do not end these articles without making some social commentary, and in this case, we need to look at how we treat disabled people and how we rush about much of the time and don’t have the flexibility to accommodate slow people. Our addiction to materialism, with its “speed and efficiency uber alles,” throw “under the bus” the poor, the homeless, the disabled, the mentally ill, by drugging them with anti-psychotic medications, incarcerating them, or ignoring their plight, and then they become more of a drain on the economy than if we had taken the effort to care for them in the first place. These people have great potential to invigorate our society if rehabilitated.

How many of these people have had trauma to the brain and did not recognize it or failed to convince the medical profession that there is an injury, and were assumed to be malingering. Dr. Elliot thinks there are many who have had “a bump on the head” and had forgotten about it and could be having significant brain dysfunction.

Dr. Elliot, an intelligent high achiever who never gives up, faced this kind of cruel treatment by society. What about the millions who have fewer resources at their disposal? How many brain-injured people end up homeless, poor, incarcerated, drugged, with psychiatric diagnoses, and who could be helped by this treatment?

This book is an extremely important book for the public to read, as it highlights very poignantly the neurological issues the brain damaged suffer, but also the social isolation. Most importantly, it shows what is possible with sometimes life saving, proper optometric and cognitive treatment.