



Research Article

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# Presenting A Model: The Complex Architecture of a Traumatic Brain Injury

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To Cite This Article: Leighton J Reynolds\*, Jemma Yoo, Megan Utomo, Marie Bilorosiuk, Joe Bolanos and Kevin Morris. Presenting A Model: The Complex Architecture of a Traumatic Brain Injury. Am J Biomed Sci & Res. 2024 23(6) AJBSR.MS.ID.003141, DOI: [10.34297/AJBSR.2024.23.003141](https://doi.org/10.34297/AJBSR.2024.23.003141)

Received: 📅 August 16, 2024; Published: 📅 August 26, 2024

## Introduction

A unique neuro-psychoanalytic model that traces the neurodegenerative progression of a traumatic brain injury (also applies to seizures, stroke, infections in the brain, and C-PTSD). For the past 8 years I have been working with traumatic brain injury patients from professional sports, car accidents, falls, and including strokes, seizures, and issues with hemorrhaging, infections, and aneurysms. Through my training and practice in Neuro-Psychoanalysis I have come to understand a model for working with the neurodegenerative progression of a TBI. Neuro- Psychoanalysis is an emerging discipline that works with the interface/intersection of neuroscience and psychoanalysis to consider how brain/mind theory and practice can help us understand and treat neurological and psychological problems.

The model describes 4 interlocking architectures that occur when the brain/mind is traumatized and continues in a cascading neurodegenerative course in attempt to rebalance itself (but unsuccessfully so). Trauma to the brain/mind occurs from blows to the head, PTSD, strokes, seizures, hemorrhaging, infections, and aneurysms. The use of the word architectures describes the progression the brain/mind goes through to re-establish homeostatic balance in mind/brain/ body. What concerns me the most here is when this neurodegenerative process moves from the disruptions to brain/mind to a breakdown in brain/mind [1].

## The Model

Is unique based on Dr. Reynolds's clinical work with TBI, Stroke, Seizure, and Brain Diseased patients from a Neuro-Psychoanalytic

perspective. This perspective works from the theory that the human mind is the subject experience of the brain. And that by listening deeply to patients' experiences with their injuries, it is possible to learn even more than what brain imaging can tell us about their injuries. This is what "listening to the brain," the subtitle of "The Complex Architecture and Healing of Traumatic Brain Injuries," is all about [2].

## Architecture One

### Shock Trauma/Traumatic Shock

This architecture addresses the initial shock to the brain/mind (from blows to the head, bleeding in the brain, seizures, strokes, aneurysms, or infection) that causes the brain/mind to go into an emergency response that also includes shutting down many brain functions. Contrary to popular thinking the brain is not built for thinking and other cognitive functions, but as an instrument of our survival. Blows to the head, PTSD, brain bleeding, seizures, strokes, aneurysms, and inflections all threaten our very survival. In some cases, the initial shock to the brain/mind causes confusion, disorientation, swelling in the brain, and instant fatigue. While at other times, the traumatic shock only begins to manifest symptoms in a few hours or after several days. In either case, the brain/mind moves into survival mode leading to the following kinds of symptoms related to physical pain:

- i. Vision Problems (blurred vision, double vision)
- ii. Difficulties with Breathing
- iii. Balance Problems



- iv. Chronic Fatigue
- v. Dizziness

## Architecture Two

### Disruptions to Electrical & Chemical Functioning

Trauma to the brain/mind too often includes disruptions to the electrical and chemical processes that allow neuronal functioning to occur. The physical damage to the neurons through shearing, twisting, and breaking of the nerve cell's axons disrupts the way brain cells (the neurons) communicate with one another. This leads to many problems including:

- i. Memory Problems
- ii. Brain Fog
- iii. Confusion and Disorientation
- iv. Difficulties with focus, concentration, and attention
- v. Difficulties with Decisions Making and Problem Solving

## Architecture Three

### Problems with Homeostatic Balance, & Allostasis/Allostatic Load

Few people realize the importance of homeostatic balance in the body and the role that allostasis plays in keeping homeostatic balance on track. Since allostasis is controlled by the brain, what happens when there are disruptions to the functionality of the brain/mind because the brain is injured? Many processes in the body are disrupted, resulting in a wide range of symptomatology. Here is the wide range of symptoms that occur following a traumatic brain injury because the process of allostasis (in support of homeostasis) is compromised.

- i. Behavior and Mood Changes
- ii. Sleep Disturbances (too much or too little)
- iii. Confusion, Disorientation, and Memory Problems
- iv. Dilated Pupils/Blurred Vision/Double Vision/No 3-D Vision
- v. Convulsions or Seizures
- vi. Dizziness/Fainting Spells/Chronic Fatigue
- vii. Sensitivity to Light, Sound, and/or Smell
- viii. Headaches or Migraines
- ix. Nausea and Vomiting
- x. Restless and/or Agitated
- xi. Slurred Speech
- xii. Chronic Crying Spells
- xiii. Brain Fog
- xiv. Difficulties Reading and Writing
- xv. Lack of Motor Coordination
- xvi. Increases in Anxiety and Depression
- xvii. Some Stats (from the US):

xviii. 1.7 million Diagnosed TBIs in 2020

xix. 64,362 TBI Deaths in 2020

xx. 32% of TBI Related Hospitalizations in 2020 were 75 years and older

This is a long list of symptoms, which are related to the damage done to allostasis and homeostatic balance from a traumatic brain injury. In addition, this increases allostatic load. An allostatic load occurs when an individual's resources are exceeded by the number of stressors they are attempting to cope with. In my experience, all illness and disease are significantly related to allostatic load in some manner.

## Architecture Four

### The Perfect Storm in the Brain

The concept of the "perfect storm" here is related to the idea that a traumatic brain injury slows the brain down much a computer that is running slowly (because of certain failures in the machine). My patients all demonstrate this by not being able to keep up with their internal and external environments. Which is extremely frustrating for them. At the same time, all trauma to the brain/mind is also a traumatic event for the person and this is PTSD (often Complex PTSD because of the length of time). PTSD speeds up actions in the brain/mind through the HPA axis (hypothalamus/pituitary/adrenal axis) to support fight/ flight/or freeze. It is these opposing forces in the brain/mind that create the "perfect storm" in the brain. And we wonder why TBI patients don't recognize themselves anymore [3-5].

## Major Concern in Presenting the Model

This Poster Project presents a perspective for both understanding and treating the long-term effects of brain injuries. What comes across in the general sense, is the understanding that Concussions and Post-Concussion Syndrome are not singular events, but rather the beginning of a long-term neurodegenerative process in the brain/mind.

## Discussion

This model was developed through the clinical experience of sitting with patients in a neuro- psychoanalytic setting, where both brain and mind were considered for treatment. Knowing how to help patients open about their experiences with a brain injury (through a blow to the head, stroke, seizures, infections, or C-PTSD) has been crucial in the understanding and treatment of brain injuries from this perspective.

## Conclusion

Experiences with this model are very clear, if patients remain in treatment and follow the protocol listed below, they always get better %100 percent of the time. This is a huge claim to make! The difficulty is keeping people in treatment, because dealing with a brain injury is complicated, demanding full-time attention, involves paying attention to the person who has the brain injury, and it is very scary to know that your brain is not working normally and is on a neurodegenerative course. However, if patients remain through the

course of treatment, two to three years to begin to heal, and then continue their treatment, they always get better. Protocol: Individualized Supplements for the Brain Stimulation of the Brain (music with headphones) Total Immersion in their Treatment Creating Flow Experiences (decrease demands on the Brain) Neuro-Psychanalytic Weekly Sessions.

### Acknowledgements

None.

### Conflict of Interest

None.

### References

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