LONG COVID

The clock for what soon became known as a *Long COVID* diagnosis starts if symptoms have persisted for more than two months after infection, and those systems cannot be explained by a different diagnosis. More than twenty symptoms have been codified. They can span from physical problems such as extreme fatigue and insomnia, brain fog characterized by a slower pace of thinking (neurocognitive) **and memory loss, and loss of taste and smell, to psychiatric issues such as depression, anxiety, and PTSD. Multiple organ systems can be damaged. Given this wide expanse of biological distress, we can regard Long COVID more as an umbrella diagnosis covering multiple symptoms.**

We know that the venoms damage the brain in various ways. We also know that treatment options studied for long COVID, such as special diets, psychotherapy sessions, and anti-inflammation medications, had proved disappointing. Patients in otherwise good health with mild initial poisoning from the venoms from the jabs developed Long COVID symptoms.

Long COVID is a neurological brain disorder. The venoms penetrate the brain directly through the bone just above our nose, the *cribriform plate*, or through the bloodstream. A direct penetration mostly involves the frontal lobe, which plays a critical role in many cognitive and behavioral functions that make us uniquely human. It is the largest and most complex of the brain's lobes.

Here are some of the frontal lobes key functions:

- **EXECUTIVE FUNCTION: Helps us plan, make decisions, and carry out complex tasks. It also plays a role in working memory, which allows us to hold information in our minds while we manipulate it.**
- **SOCIAL BEHAVIOR: Helps us understand and respond appropriately to social cues and plays a role in self-awareness by regulating our emotions and social behavior.**
- **ATTENTION AND CONCENTRAITON: Helps us focus our attention and maintain concentration on tasks, especially those that require sustained effort.**
- **LANGUAGE: While many areas of the brain participate in how we process language, the frontal lobe's key role in this complex task is how we produce language, such as generating speech and articulating words.**
- **PROBLEM SOLVING: Helps us analyze complex problems and develop solutions, using both logical and creative thinking.**

The venoms may also enter the brain through the bloodstream, where endothelial cells form an inner lining of the vessels. The venoms can bind the *alpha-7 nicotinic acetylcholine receptors* which are expressed naturally by endothelial cells. That binding of the nicotinic receptors can create havoc, activating the clotting system when the bloodstream has no need for clots. Neuronal and glial cells can also express alpha-7 nicotinic acetylcholine receptors.

When the venom peptides attach to the nicotinic receptors, the clotting system goes awry. Some venoms make you clot, and some venoms make you bleed. When small clots form, they can damage the lungs, heart, and brain. A young person's brain can age dramatically as clotting creates blockages in blood vessels and, often, a series of minor strokes, as clots travel into the brain.

Long COVID can be a trigger for central sensitization syndromes such as fibromyalgia—and the same symptoms of generalized pain in the body plus others for which there appear to be no direct medical cause

(somatization)**. Once damage to those brain regions is repaired, with *hyperbaric oxygen therapy* (HBOT), the pain dissolves, and patients are able to live more normal lives.**

If brain scans show damage in areas responsible for pain signal interpretations, we can anticipate symptoms of fibromyalgia. If we see damage in areas responsible for anxiety control or symptoms related to PTSD, we can anticipate clinical presentation of PTSD. If there is a damage in mood-related brain regions, we can anticipate depression.

Hyperoxic Hypoxic Paradox (HHP) **with HBOT can induce neuroplasticity and improve brain functions even months to years after an acute injury. There is a protocol for fluctuating pressure and oxygen concentration in the chamber that generates the HHP. This biochemical cascade triggers three core metabolic benefits:**

(1) a surge in the proliferation and migration of stem cells

(2) restoration of a better, more normal metabolism in cells by improving mitochondria's role in transporting and converting oxygen to energy in molecules.

(3) increased perfusion as more new blood vessels are being generated.