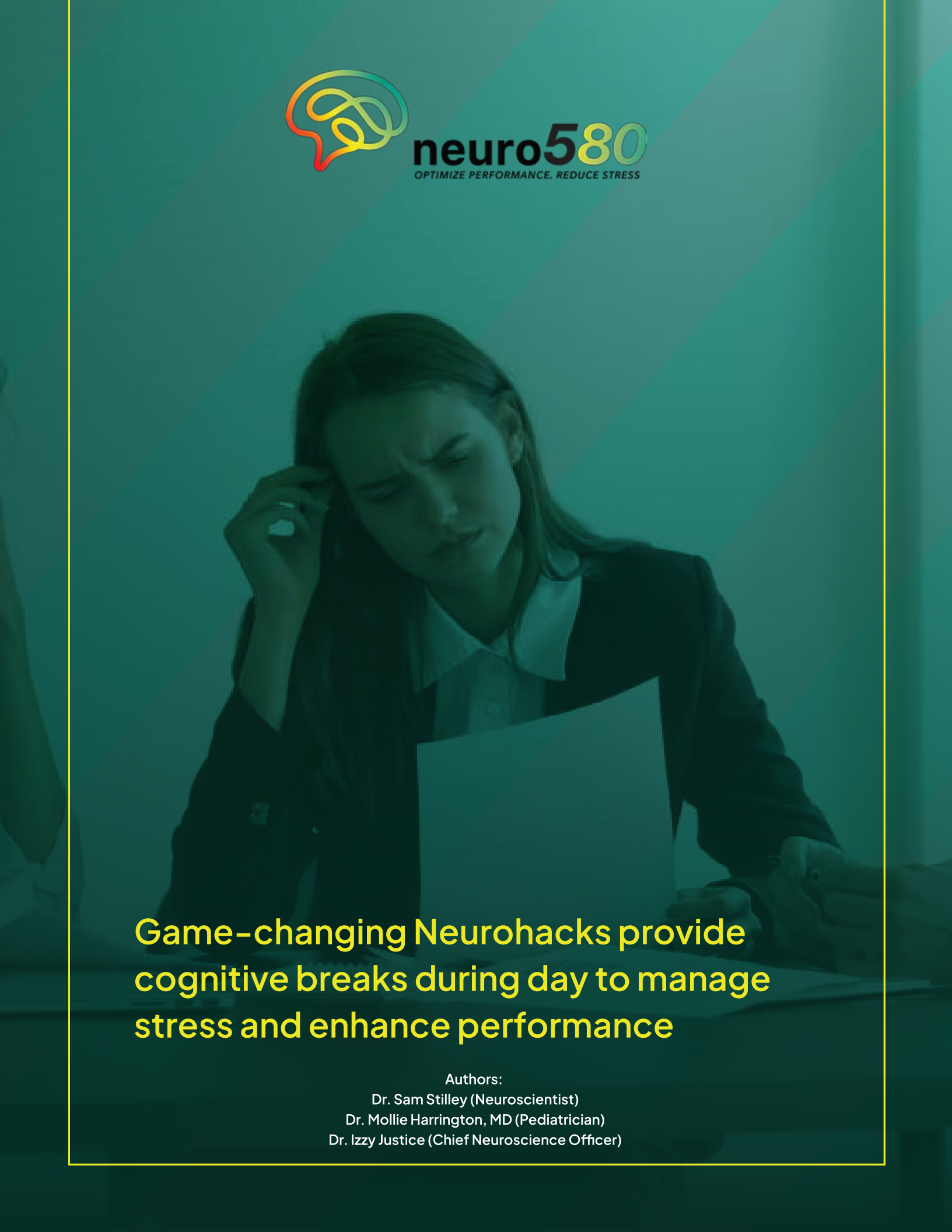
neuro580
OPTIMIZE PERFORMANCE, REDUCE STRESS



Game-changing Neurohacks provide cognitive breaks during day to manage stress and enhance performance

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Introduction

The starting point of an examination of the Human Experience today should include the skyrocketing consumption of stimuli by the brain. Stimuli is now accessible anywhere anytime through mobile devices such as phones, wearables and such.

How different is the state of the brain today vs a generation ago? What are the consequences of this to each brain? Are the risks different per generation or demographic? Can we conclude that we at least need different self-care tools previously not needed or considered?

At only about 3 pounds of weight, the brain consumes about 25% of resting metabolism.[1] The brain is an intricate network of soft tissue that wears and tears, requiring time to repair and remove waste, all the while processing enormous volumes of stimuli non-stop. Without sufficient breaks, managing our mental state becomes increasingly challenging, leaving many struggling to find moments of calm and focus amid the constant flow of information.

In today's highly connected world, our brains are constantly exposed to various stimuli from smartphones, social media, television, work demands, and other sources of information. While this continuous engagement can help keep us informed and entertained, certain types of overstimulation, especially multitasking and prolonged screen use, can be associated with stress, anxiety, diminished focus, and sleep disturbances, particularly when there is limited mental rest.

Dr. Izzy Justice, Dr. Sam Stilley and Dr. Mollie Harrington, MD, posit that the ability to provide the brain with frequent cognitive-centered breaks, called neurohacks, during the flow of a day is essential for maintaining mental well-being for both performance as well as to reduce stress from the stimuli overload consumption. This white paper explores how these neurohacks, grounded in neuroscience, can help individuals manage overwhelming stimuli more effectively to reduce stress and amplify attention to tasks/experiences that matter.

1 Leonard, W. R., & Robertson, M. L. (1994). Evolutionary perspectives on human nutrition: the influence of brain and body size on diet and metabolism. American Journal of Human Biology, 6(1), 77–88.

The Problem

Consider the enabling technology:

1. In 2010, there were 1.6Billion mobile devices in the world. By 2025, there will be over 20 Billion mobile devices worldwide.

2. The amount of functionality, speed and connectedness within a mobile device has also exponentially increased. This has led to unprecedented levels of dependency on devices and it is highly unlikely to diminish.

3. In addition to instant information, the devices have also enabled instant communication, a portion of which is instant-shared trauma and micro-trauma. **We read/hear/see more negative stimuli than any other time in human history**. Negative stimuli carry a higher "spike" in EEG in the brain, the recovery from which can take significant amounts of time. These daily spikes onto soft tissue in the brain is stress which concurrently reduces the brain's functionality for subsequent activities.

Consider the cognitive impact of above:

1. Excessive screen time and frequent technology use can lead to various negative effects, such as increased attention-deficit symptoms, reduced emotional and social intelligence, technology dependency, social withdrawal, hindered brain development, and sleep disturbances.[2]

2. Current data suggests that the mind is wandering (not focused on present stimuli) 65% of the time. (Harvard, Matt Killingsworth)[3]

3. Resulting in the brain distracting itself every 3–10 seconds making the primary cause of loss of focus being our own brains processing the daily volumes of stimuli.

4. It can take up to 23 minutes to recover from 1 distraction.

5. Essentially, our normal current brain state is making us all "rookies" - performing with such noisy brains that we are unable to access relevant past experiences (stored in the same brain).

2 Small GW, Lee J, Kaufman A, Jalil J, Siddarth P, Gaddipati H, Moody TD, Bookheimer SY. Brain health consequences of digital technology use Dialogues Clin Neurosci. 2020 Jun;22(2):179–187. doi: 10.31887/DCNS.2020.22.2/gsmall. PMID: 32699518; PMCID: PMC7366948.
3 Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. Science, 330(6006), 932–932.

Consider the impact on performance:

1. Mental Wellness cost UK employers $4Billion/year of loss productivity. (Deloitte)
2. 76% Employees experience burnout. (Gallop)
3. 60% College Students feel high anxiety. (ACHA)
4. 72% High school students do not sleep well. (CDC)
5. Approximately 70 million Americans suffer from a sleep disorder.

Consider the impact on our children and youth:

1. 42% of High School students, including 57% of high school females, are feeling persistently sad or hopeless. (CDC National Youth Risk Survey, 2021)

2. 29% of High School students are experiencing poor mental health. (2021 CDC survey)

3. The US General Surgeon Vivek Murphy, MD has released recent Advisories (2021, 2023 and 2024) regarding the alarming increase of poor mental health in youth as well as the harmful effects of social media on the mental development of young people.

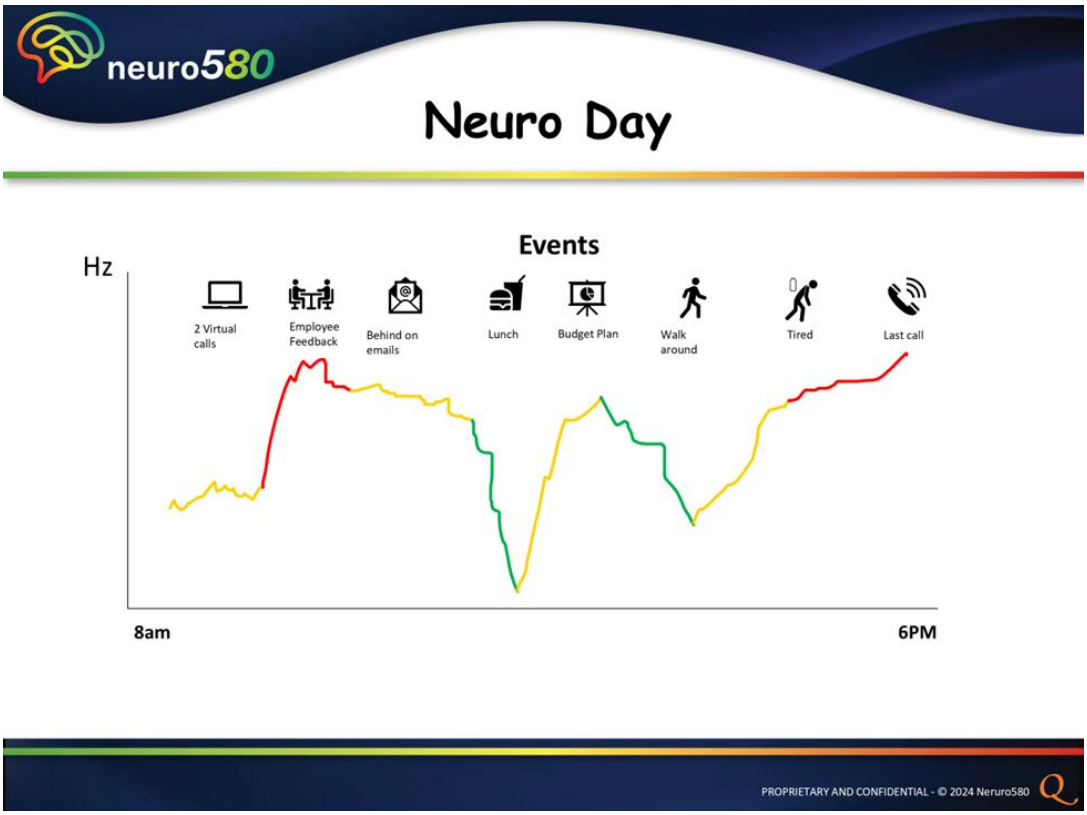
Final considerations:

1. Throughout the education and learning systems (K-12, College and Workplace Training), there is little to no education on the brain. There is a world-wide need for science-driven language and self-care tools.

2. Self-care stress-relievers pre and post work or school day are available, such as physical activities, music, cooking, painting, socialization, entertainment etc. But very few options are available **DURING** the work day or school day.

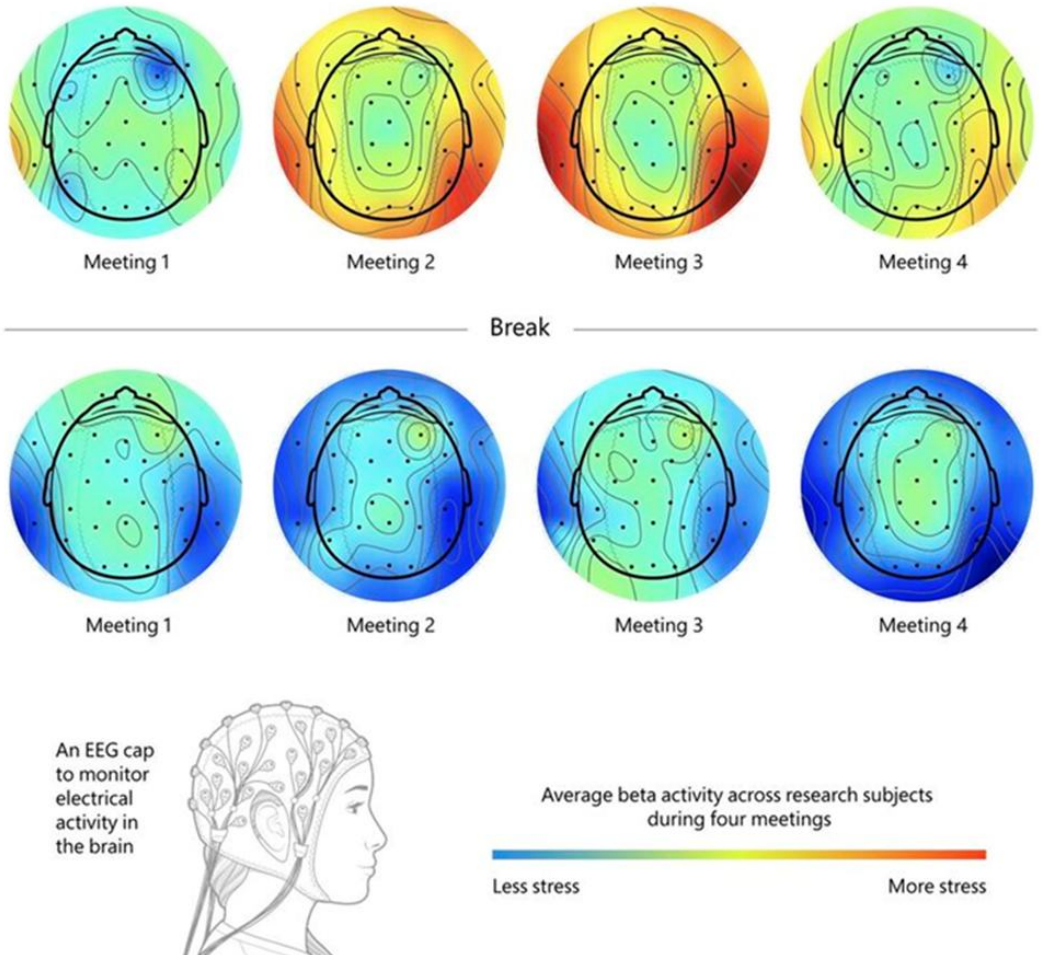
Consider a normal workday from a Neuro perspective:

This graph from an attendee at a training session shows how each workday activity comes with cognitive fluctuation and cost. She mapped out her day-before using the colors of Red, Yellow and Green to label the 'spike' of her previous day activities. When in 'Red' state, her access to her cogntiive inventory of knowledge and skills is severely diluted. Each day is essentially a Mental Endurance Test. Left unmanaged, take-home stress from each day can be significant.



Precedence Studies:

Numerous studies ** have shown the **DURING-THE-DAY** breaks to the brain reduce stress and increase performance. Brain scans from Microsoft's Human Factor lab confirm Neuro580's and other studies:



The challenge with all the breaks studied are:

1. They are centered around time (10–30+ minutes in duration).

2. They are centered around an activity typically requiring additional logistics (equipment for activity, travel to activity, additional human resources, etc).

Neuro580 has created a game-changing way to leverage the same source of over-stimulation (mobile devices) to curate customized neurohacks that take seconds. It starts with a universal (global) agnostic language not aligned to any culture or region of the world - colors! - that can be adopted multi-generationally worldwide. Replacing the existing charged emotional language (mad, angry, stressed, happy, calm, focused, etc) with three labels (Red, Yellow, Green) that depict brain states is Step 1. Based on this state, the appropriate neurohack can be accessed and implemented, anytime anywhere for any situation. Scalable online Training and Education can also be provided.

The Science:

1. The brain has measurable electricity (Hertz).

2. Studies have shown that Alpha or Theta (5–15Hz) bands of electrical function in the brain are associated with.

   - Relaxed states of cognitive function and creativity *Calm. (n.d.). Alpha brain waves: What are they and how to increase them. Clinically reviewed by Dr. Chris Mosunic, PhD, RD, CDCES, MBA. Calm. Retrieved [access date], from https://www.calm.com/blog/alpha-brain-waves*

   - Enhanced access to relevant memories *(Klimesch, 1999)*

   - Increased thalamic activity (Sensory Input) which is key to "being in the present moment" by hearing what is around you, tasting ingredients, smelling foods, seeing all that is around us and feeling sensations through key parts of our body such as our feet/hands/face *(Hughes & Crunelli, 2005)*

   - All these are a high level of Parasympathetic State

3. Studies have also shown that high Beta or Gamma (20+ Hz) bands of electrical function in the brain are associated with.

   - Increased cognitive load and mental stress, anxiety and high arousal *(Abhang et al, 2016)*

   - Increased task-specific focus and cognitive load, as high beta activity supports sustained attention on immediate tasks, which can lead to a more rigid, narrowed focus, limiting cognitive flexibility *(Ray & Cole, 1985)*

   - All these are a high level of Sympathetic Nervous System (Autonomous) designed to protect us (Fight, Flight, Freeze)

Relatively recently, we have been able to look into the brain FUNCTIONALLY (while performing a task). Neuro580 initially studied athletes trying to perform a neuromuscular sequence of function that required accuracy with an immediate result, such as shooting a free-throw in basketball or hitting a 6-foot putt to a hole. Neuro580 claims:

1. The minutes and seconds before a functional task, neurohacks that took seconds were introduced to shift the electrical activity from Beta/Gamma (Yellow/Red) to Alpha/Theta (Green). The resulting increase in accuracy and decrease in dispersion (variance in performance) was significantly less corroborating previous studies where more time-consuming methods were used.

2. These same neurohacks were then used in non-athletic situations resulting in similar results of less stress, amplification of attention (focus) and high cognitive performance.

3. Identifying high stress events (spikes) and 'spiking them down' using neurohacks to allow brains to access existing knowledge and skills throughout the day is both a stress reduction and a high performance skill set.

Neurohacks and Red, Yellow, and Green States

The human brain is NOT Red, Yellow or Green. In scans, these are typical colors used globally to identify levels of brain activity. Red, much like that of a weather radar image, implies intense function (40+ Hz). Yellow, a more 'normal' state implies steady flowing states (15–30 Hz) and Green implies that desired Alpha/Theta brain activity of Calmness and Focus. It was a mere coincidence that this labeling system is similar to Traffic Lights around the world and these colors are typically used in the workplace as well to depict progress in project management functions or other areas of tracking. Neuro580 leverages this existing agnostic standard of identification for states of brain function.

Neuro580 also claims that the kinds of neurohacks required to get to Green from Red would be different than those required to get to Green from Yellow, or if Green, to stay in that Green state. If the brain is Red (40+ Hz), an intervention would need to work much faster than if Yellow to get to Green. Translating to **DURING** the day breaks, different neurohacks are used at different times of the day depending on the subject's brain state. Each Neuro580 neurohack is not only curated to the brain state (Red, Yellow or Green) but also to each individual.

What is a Neuro580 Neurohack?

A Neurohack is a BREAKTHROUGH approach: cognitive nutrition (performance booster) that reduces the quantity and intensity of brain waves (stress) towards Alpha/Theta Frequency.

A Neurohack is designed to be used in-the-moment to navigate the next few seconds or minutes at a higher level of focus and calmness, certainly long enough to execute the next task at hand at lower levels of stress.

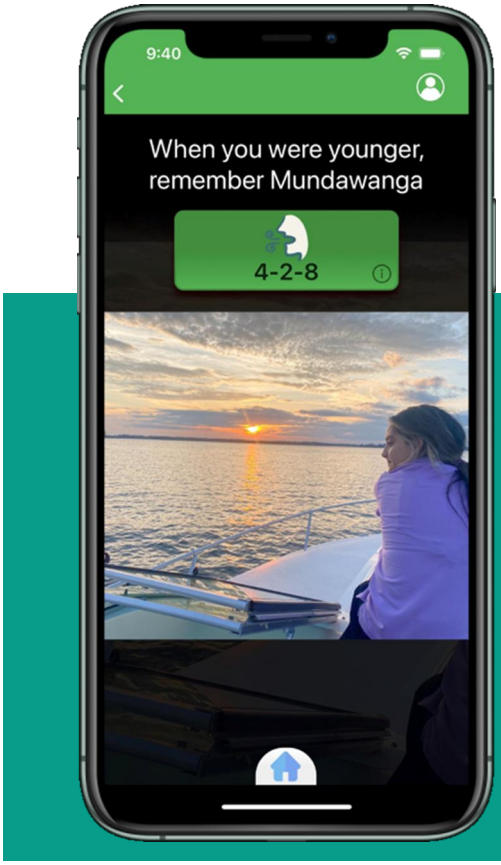
Neuro580 neurohacks are not meant to replace other wellness activities (Meditation, Mindfulness, Physical Activity, etc) but instead to complement these activities when time, privacy and other logistics are not available.

Neuro580 Neurohacks are a combination of:

Physical Activity: Takes 5–20 seconds, no equipment needed, done anywhere

Past Positive Memory: Neuroscience shows powerful impact on brain recalling personal positive experiences

Visual Positive Memory: Neuroscience shows powerful impact on brain seeing personal positive experiences



Example from Neuro580 App

After just 2 clicks (what is your Brain Temperature & Where are you) the above customized screen is presented using Machine Learning and AI.

1. There are 3 neurohacks presented on 1 screen.

2. At the top is a past positive memory. Mundawanga is a name of a childhood park where positive experiences occurred.

3. In the middle is a physical neurohack (4–2–8) with an embedded 5 second video. This neurohack is a breathing task asking the user to breathe in for 4 counts, hold for 2 and breathe out for 8 counts.

4. At the bottom, is a picture of the user's daughter on a lake. The app auto selects past images based on the brain temperature. The user rarely sees past images on their phone and neurohacking is about accessing these positive images.

5. All of the above 3 neurohacks take about 60 seconds to feed the brain. This is time anyone can make during their day when spikes (surprises or negative stimuli) occur.

All Neuro580 neurohacks activate the parasympathetic nervous system (PNS). The physical neurohacks activate the PNS via the Vagus Nerve.

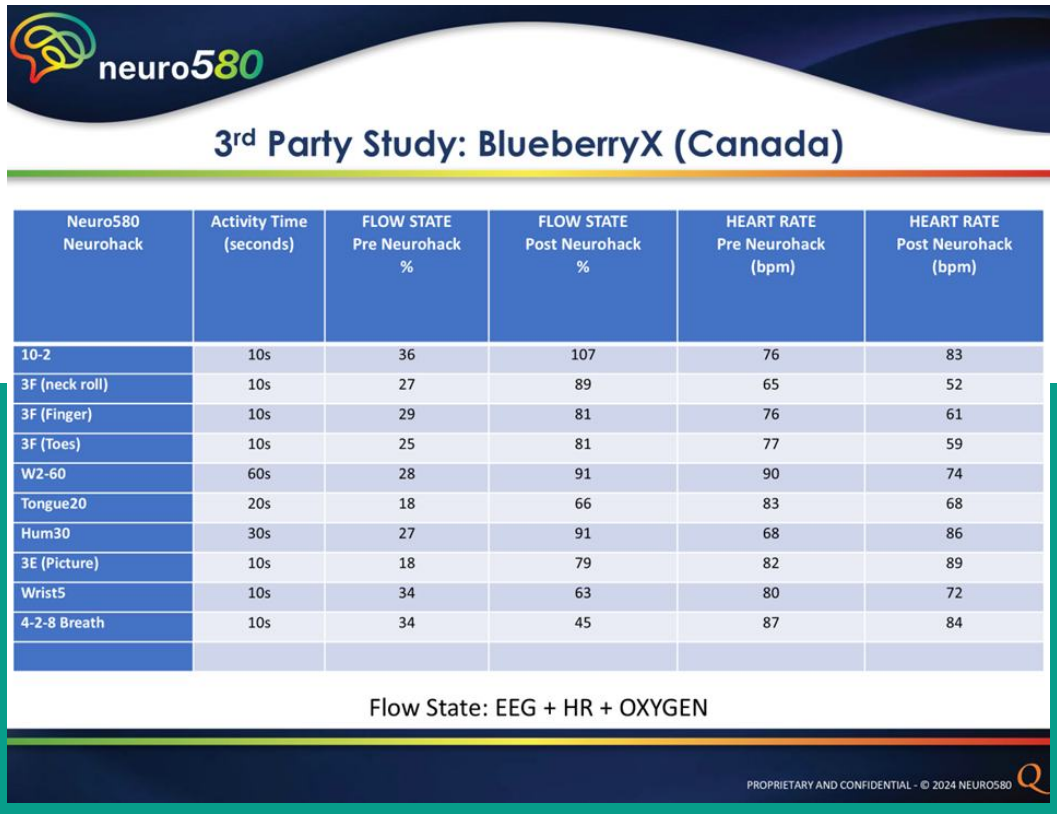
Neuro580 makes a claim that positive past memories are an underutilized cognitive asset that can be triggered (intentional stimuli to brain) either by writing or visually. Most of us have hundreds and thousands of visual images on our phones (photo album), pictures and videos. The ones we typically keep tend to lean towards positive memories (Green) we want to recall, but rarely do.

Neurohacks Nomenclature

Neuro580 Neurohacks are all names with numbers, such as 10-2, 3F, 3E and so on. This was done intentionally to further create an agnostic (non judgmental) system easy to adopt multi-generationally and globally.

3rd Party Efficacy

A 3rd Party (BBX Canada) uses a device that captures EEG (electrical activity), Oxygen levels in brain as well as Heart Rate on Neuro580 Neurohacks. Below are the results. Flow State is the triple bio-marker of these 3 measures.



Neuro580 Neurohack	Activity Time (seconds)	FLOW STATE Pre Neurohack %	FLOW STATE Post Neurohack %	HEART RATE Pre Neurohack (bpm)	HEART RATE Post Neurohack (bpm)
10-2	10s	36	107	76	83
3F (neck roll)	10s	27	89	65	52
3F (Finger)	10s	29	81	76	61
3F (Toes)	10s	25	81	77	59
W2-60	60s	28	91	90	74
Tongue20	20s	18	66	83	68
Hum30	30s	27	91	68	86
3E (Picture)	10s	18	79	82	89
Wrist5	10s	34	63	80	72
4-2-8 Breath	10s	34	45	87	84

This link provides testimonials from people using Neuro580 Neurohacks
https://neuro580.com/testimonials/

Scenarios where Neuro580 Neurohacks can be used:

1. Just before a critical meeting at work.
2. During a key meeting at work.
3. Just before a key performance (athletic, artistic, scholastic).
4. Immediately after a negative surprise to dilute the 'spike' in brain.
5. Before Sleep (Neuro580 has a sleep-specific neurohack).
6. Stuck in traffic. Commute to or from work/home to reduce take-home stress.
7. Throughout the day as events occur that spike us.
8. By children to manage daily spikes before/during exams and out-of-class social stress spikes.

Neuro580 encourages neuroscientists and performance psychologists to duplicate Neuro580 studies. Neuro580 is happy to provide its library of neurohacks via its app to any 3rd party to evaluate and report on the results. We encourage the expansion of understanding and collaboration on easier self-care tools to manage our daily spikes (stress) so we can have a better human experience individually and collectively.

Conclusion:

In an overstimulated world, managing our mental state has become essential for preserving both mental well-being and peak cognitive function. The constant influx of digital stimuli from smartphones, media, and demanding schedules challenges our ability to find moments of calm, making it critical to adopt effective strategies for brainwave regulation. Neurohacks, rooted in neuroscience, offer a practical and accessible approach to lowering brainwave activity, which can promote calmness and enhance both mental and physical performance, particularly in high-stakes settings.

Today's youth, facing unprecedented levels of anxiety and depression, stand to benefit immensely from these techniques also. Neurohacks, such as those provided through Neuro580, are easy and accessible for children, adolescents, and the adults in their lives, offering powerful self-care on-the-go tools to help manage stress, build resilience, and foster a balanced mental state in today's fast-paced world.

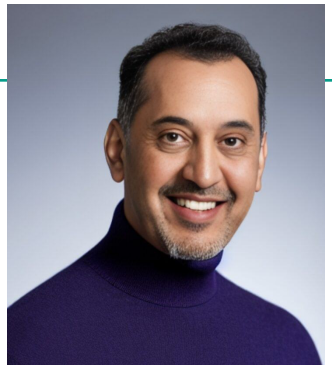
Authors

Dr. Sam Stilley (Neuroscientist)

Holds a PHD in Integrative Biology with a focus on neuroscience and an MBA, combining deep scientific expertise with strategic business skills. Her research on anti-seizure compounds and neuroinflammatory pathways has led to a patent application, peer-reviewed publications, and national conference presentations.

Dr. Mollie Harrington, MD (Pediatrician)

Is a Pediatrician serving the children and youth in rural western North Carolina. She has also been the medical director for the Haywood County Psychological Association and has served on the Board for the Haywood County Health Department.



Dr. Izzy Justice (Chief Neuroscience Officer)

The Chief Neuroscience officer of Neuro580. He has authored 8 books, host of Chasing 10Hz Podcast, and serves as a performance coach to executives and professional athletes and teams.