

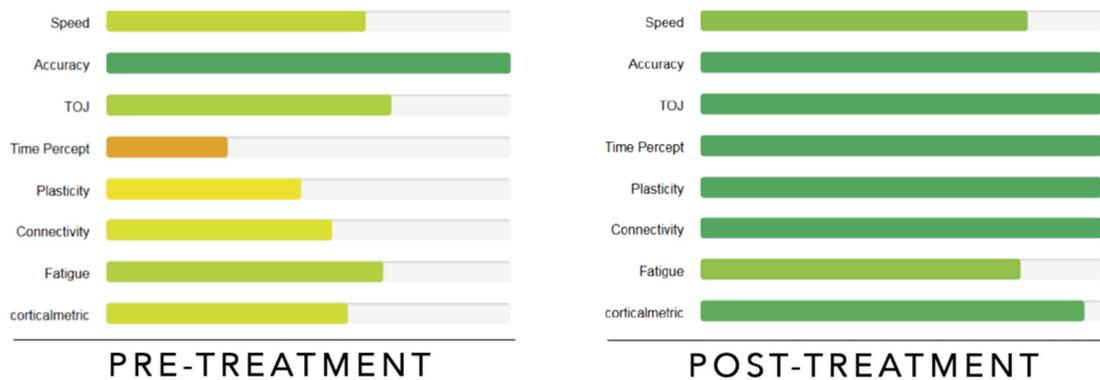


Welcome to the second issue of Cortical Metrics Insights!

Insights is meant to educate and inform people interested in developing a better understanding of brain health and brain health assessments.

In each issue, we'll provide sample case studies, summaries of publications of interest and/or details about one of the measures that we collect.

Improvements in Brain Gauge performance parallel mTBI recovery



Dr. George Roth has consistently provided reports that demonstrate patient improvement in **corticalmetrics** post-treatment.

A 40 year old patient suffered direct left parietal head trauma from a motor vehicle collision, and 8 months post-trauma, the patient continued to suffer from cognitive, visual, and vestibular disorders. Patient was also sensitive to light and noise, reported neck pain, and was unable to continue in her post-graduate program. The patient had sustained one previous concussion in 2005.

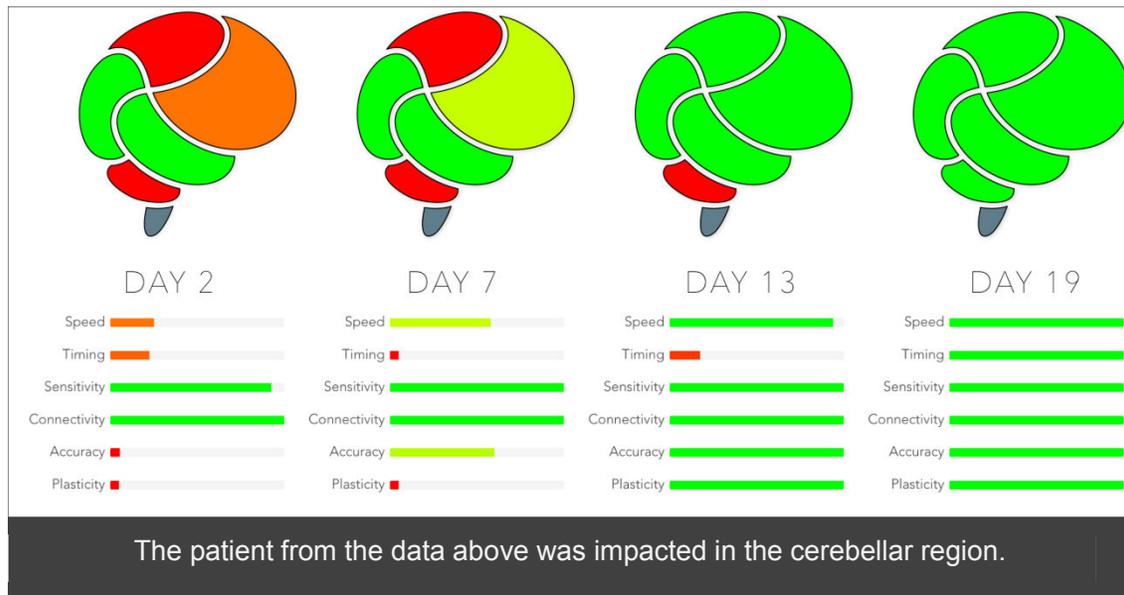
Cortical Metrics tests showed diminished function in multiple metrics. After a single

treatment using Matrix Repatterning focusing on C1-C3 and the occipital, temporal, parietal, and sphenoid regions, the patient reported improved cognitive function and reduced sensitivity to light and noise. Cortical Metrics results from one day post-treatment demonstrate greatly improved function in all areas. Objective findings post treatment also revealed improvements in visual tracking and pupillary response and a disappearance of the Babinski response. The patient was able to return to their graduate program.

Acknowledgment: Thanks to Dr. George Roth for his contribution.



Trauma to different areas of the brain
differentially impact **cortical**metrics scores



Each of the **cortical**metrics tests targets a different neural pathway and/or mechanism. Many factors contribute to the performance of an individual post-trauma on a test battery, and one of those is the impact site and/or orientation of the impact of the trauma. Other factors on

test results include force of impact of the trauma, trauma history, medication, alcohol use and sleep/fatigue.

Highlighted measure: *Timing Perception*



Timing perception, or the ability of an individual to determine how long an event lasts, is most reliant on a pathway that includes cerebellar activity. Note the pathway indicated in the image at left. If this pathway is disrupted, then timing perception will be impacted. Other functions that the cerebellum are involved in include coordination and balance.

How is timing perception measured with the Brain Gauge?

One of the protocols in the concussion test battery is called duration discrimination (DD). What is actually measured is how well the subject can determine which of two stimuli last longer. How do we know this? A number of research studies have used TMS to block activity in the cerebellum. The result was that whenever cerebellar activity was blocked, timing perception, or the ability to differentiate the duration of two stimuli, whether they be tactile, auditory or visual, was significantly reduced.

