**Brainwaves: Impact of Today’s Top Therapies Quantified on qEEG and sLORETA Imaging**

**Instructor: Dr. Michael S. Trayford DC, DACNB, BCN**

**Times: Fri 12:00-8:55pm & Sat 8:00-12:15pm**

**Total CE hours: 12**

**Abstract Summary**: Low-level laser therapy (LLLT) has a long history in the treatment of musculoskeletal conditions; although, the benefits of laser therapy for neurological disorders, brain trauma, learning and behavioral issues, and more is just coming to light. One area with little emphasis in the research is the impact of LLLT on electrophysiological activity of the brain; more specifically, EEG. This course will cover the basics of EEG physiology and physics, database analysis of EEG (qEEG/sLORETA imaging), functional neurological applications with laser therapy in populations with neurological compromise, and case studies demonstrating the impact of LLLT on brainwave activity and overall health and longevity.

**Main Objectives**:

* Basic understanding of EEG physiology, quantification of EEG via database analysis, and rehabilitative strategies that will impact EEG
* Recognize patterns of EEG activity in brain injury, learning and behavioral disorders, and cognitive impairment; as well as normal studies
* Review of other neurological/clinical findings that may correlate with certain EEG patterns
* Understand pharmacological impacts on EEG data
* Provide case studies and clinical practice scenarios to promote proficiency pertaining to EEG and functional neurological interventions; including low-level laser therapy
* Learn functional neurological applications of laser and combined physical/cognitive rehabilitation strategies
* The impact of diet and metabolic/nutritional intervention on brainwave output

**Takeaway Concepts** (The learner will be able to…):

* Recognize the importance of EEG and qEEG imaging and its value in clinical practice
* Understand progressive treatment paradigms that can be used immediately
* Understand outcomes assessments that demonstrate the efficacy and quality of therapies in the field of functional neurology and LLLT

**Key Words**:

* Functional Neurology, Plasticity, EEG, qEEG, sLORETA imaging, Brainwaves, Hemisphericity, Neurodegenerative Disease, Brain Injury, Learning and Behavioral Disorders, Photobiomodulation, Laser Therapy, Photons, Laboratory Testing

**Targeted Clinicians**: This program is designed for the following provider types (Those with state licensure and or practice and utilization parameters of the material taught as defined within their individual scope of practice):

* Doctors of Chiropractic
* Medical Doctors
* Doctors of Osteopathy
* Naturopaths
* Nurse Practitioners
* Physician Assistants
* Acupuncturists
* Oriental Medicine Providers
* Certified Health Coaches

**Instructional Methods**:

* Podium presentation
* Video recording
* Power point usage
* Dry erase board usage
* Hands on demonstrations
* Q and A sessions
* Case Studies
* Slides available
* Post session testing for credit as set forth by the standards needed per hour

**Summary**: The information in this lecture is designed to connect the practitioner to real life clinical scenarios with material and concepts that are rapidly evolving. Many components of this lecture can be coupled with overall health and wellness which is supported by appropriate neurological evaluation and laboratory testing for the aforementioned topics. Students will have notes and references to utilize as a study tool along with cases and access to instructor during session times.

**Program Outline:**

**Friday 12:00-8:45**

**11:30-12:00 Registration: Meet and greet, find your seat**

**12:00-1:30 Basic Sciences**

* + - Course outline summary/Flow of material
		- Basic neurophysiology as it relates to EEG electrophysiology/physics
		- Understanding normative/neurotypical EEG waveforms
		- Basic laser physiology/physics

**1:30-1:45 Break**

**1:45-2:45 Basic Sciences**

* + - Basics of EEG variants/non-neurotypical waveforms/artifacts
		- Introduction to qEEG databases and quantitative EEG analysis
		- How lasers influence electrophysiological output of the cortex and the nervous system in general

**2:45-4:00 Basic Sciences**

* + - Basic understanding of abnormal brainwave patterns in TBI, learning and behavioral disorders, and cognitive impairment
		- Introduction to sLORETA imaging

**4:00-4:30 Dinner (Provided by Erchonia)**

**4:30-5:45 Principles of Practice/Philosophy**

* + - Lab testing to augment/enhance treatment outcomes in complex neurological cases
		- Using functional neurology, chiropractic care, nutrition, and LLLT for facilitating neurological recovery and improvement of impaired EEG patterns in TBI

**5:45-6:30 Physical therapy/Physiological Therapeutics**

* + - qEEG case studies (TBI)
		- Neurological rehabilitation techniques and applications
		- LLLT applications
		- Discussion

**6:30-6:40 Break**

**6:40-8:55 Physical Therapy/Physiological Therapeutics**

* + - qEEG case studies (learning and behavioral disorders/cognitive impairment)
		- Neurological rehabilitation techniques and applications
		- LLLT applications
		- Discussion

**Saturday 8:00-12:15**

**8:00-10:00 Physical Therapy/Physiological Therapeutics**

* + - Live demonstration of raw EEG data acquisition, EEG artifcating, qEEG analysis, and real-time sLORETA imaging
		- Impact of LLLT on real-time EEG imaging

**10:00-10:15 Break**

**10:15-12:15 Physical Therapy/Physiological Therapeutics**

* + - Discussion of live demonstration and continuation if needed
		- Condition specific applications of LLLT for impacting EEG/brainwave output, and overall neurological health
		- Hands-on Laser demonstration
		- Summary review of research, physiology, clinical applications
		- Case studies, time permitting
		- Wrap-up discussion
		- **Q and A**