

Program Name: Functional Neurology For Your Lifetime 2024
Location: Online Re-Play
Date(s): Beginning September 26, 2024
Times: Anytime
Instructor(s): Alden; Boynton; Brock; Buerger; Burns; Cedermark; Connelly; Easton; El; Fetterly; Fitzgerald; Gaudet; Hall; Hanscom; Hanson; Kessler; Longyear; Mehlenbacher; Melillo; Mladenoff; Nelson; Rubin; Smith; Sullivan; Spoelstra
CE Hours Requested: 32 Total Hours

TIME: 1 Hour

INSTRUCTOR: Laura Hanson, DC

TITLE: Neuroimmune Regulation and the Wiring of Baby Human

Review markers associated with interruption in brain development during pregnancy and within the initial three years of life that manifest into diagnoses of Autism, Attention deficits, and disruption in the organization of the brain, typically called Dyslexia. Education is key in understanding the role of the neuroimmune system and the risk of chronic illness. The pregnancy history identifies potential immune issues and chronic stress patterns that are now associated with changes in brain development. As a child navigates their development there are open windows of development that can have an impact on reaching "typical" brain development. Following pregnancy, it is important to understand how the internal and external environmental exposures have a far-reaching impact. In 2011 54% of children had at least one of 20 chronic health conditions: 4:10 are depressed, 1:5 is obese; 1:5 experience suicidal thoughts; 1:6 are developmentally delayed; 1:10 are anxious; 1:10 are labeled ADHD; 1:12 have asthma; 1:13 have food allergies; 1:36 are diagnosed Autistic; 1:285 are diagnosed with Cancer. The National Survey of Children's Health, in 2020-21, children ages 3-21 receiving special education services under IDEA was 7.2 million or 15%. The most prevalent category was specific learning disabilities at 33%. We are losing a generation of children.

As we look at the whole person, each person is a mechanical being, they move in order to turn their brain on. Each person is a chemical being. Chemistry is revealed through functional labs. Chemistry provides our work to "stick". Each person has a brain and a mind. Bringing this triad together as each patient is served provides results. Each participant will gain greater insight into the progression of development and how the brain is wired from the bottom up. We will review functional labs that help identify risks, such as MTHFR and elevated strep antibodies and its role in PANDAS. Then, perhaps be introduced into brain mapping that reveals how this little human's brain is wiring and how it is associated with the behaviors they demonstrate.

Key Presentation Points:

1. Preconception: building baby human
2. Pregnancy: Brain development, the role of the environment
3. Delivering of baby human: the impact on the microbiome and immunity
4. Reflexes to Sensory motor development
5. Open windows of development and its impact on how the child is presently functioning.

Description and Supporting Research:

1)Relative Power of Specific EEG Band and their ratios during neurofeedback training in children with ASD. DOI: 10.3389/fnhum.2015.00723

2)Neuropsychiatric Disorders Associated with Streptococcal

Infection: A Case-Control Study among Privately Insured Children. DOI: 10.1097/CHI.0b013e3181825a3d

3) Development of the gut microbiota in infancy and its impact on health in later life. DOI: 10.1016/j.alit.2017.07.010

TIME: 1 Hour

INSTRUCTOR: Monika Buerger, DC

TITLE: Maternal Immune Activation and Altered Neurodevelopment: A COVID Sequela

This presentation will focus on maternal stress and immune compromise leading to altered immune regulation in the newborn and the potential long-term neurodevelopmental consequences. This lecture is particularly important following the COVID pandemic and is relevant to any practitioner that works with women and/or children. Understanding the signs of chronic neuroinflammation during neurodevelopment is a must for early intervention.

Key Presentation Points:

What is maternal immune activation syndrome?

How does it affect the developing fetus?

What are key signs in mother and baby?

How to address women during preconception and the prenatal periods.

How to support the developing nervous to optimize neurodevelopment.

References Available Upon Request

TIME: 2 Hours

INSTRUCTOR: Amy Spoelstra, DC

TITLE: Navigating Typical Development and Specific Challenges in the School-Aged Child

I. Introduction

A. Importance of Understanding Typical Development

B. Identifying Learning and Behavioral Challenges in School-Aged Children

II. Understanding Typical Development and Common Childhood Challenges

A. Milestones of Typical Development (Ages 5-12)

B. Impacts of Developmental Patterns on Learning and Behavior

C. Discussion on Critical Impact Periods and Academic Readiness

D. Whole Child Assessment and Multi-Pillared Approach to Academic Readiness

III. Early Signs of Challenges

A. Identifying Red Flags and Early Signs

B. Importance of Early Intervention

C. Determining Appropriate Educational Demand

D. Long-term Consequences

IV. Bottom-Up Approach with a Visual Cognitive Finish to Working with Children

A. Explanation of Bottom-Up Approach

B. Developing Immediate and Long-term Strategies

C. Clinical Solutions and multifaceted approach for Optimal Outcomes

VI. Emphasis on Learning Challenges

A. Early Signs in Reading, Writing, and Math

B. Object and Picture Symbol Recognition

VII. Collaborative Approach to Care

A. Importance of Collaboration Among Educators, Healthcare Providers, and Parents

B. Strategies for Developing Collaborative Care

VIII. Identifying and Working with Multiple Providers

A. Challenges and Strategies for Coordinating Care

B. Importance of Communication and Information-Sharing

C. Value of Re-examination and Whole-to-Part Collaborative Approach

X. Case Studies and Practical Applications

A. Presentation of Case Studies

B. Illustration of Strategies Discussed in Practice

References:

Berk, L. E. (2013). Child Development (9th ed.). Pearson.

Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). From Neurons to Neighborhoods: The Science of Early Childhood Development. National Academies Press.

Haas A, Chung J, Kent C, et al. (March 15, 2024) Vertebral Subluxation and Systems Biology: An Integrative Review Exploring the Salutogenic Influence of Chiropractic Care on the Neuroendocrine-Immune System. Cureus 16(3): e56223. doi:10.7759/cureus.56223

TIME: 2 Hours

INSTRUCTOR: Robert Melillo DC, PhD (C), DACNB, FACFN, FABCDD

TITLE: New research in functional neurology and translating this into outstanding clinical outcomes.

Creating evidence-based standards in functional neurology through outstanding clinical outcomes. Then turning these clinical outcomes into standardized neurological rehab through evidence-based practice. This is how we then create new standards of care. This also means that over time we must revisit and modify the 'way' we focus on our protocols within the practice we have established, to continue to evolve this to allow for changes based on this research and refinement. Novel evidence-based therapeutic practice continues to expand and shift thanks to clinical case studies that impact how we utilize tools and technology, but more importantly how we understand the brain pathways and general functional developmental behavioral neuro-immunology.

Teaching Points:

- We will review brand new research papers published in the field
- We will discuss the updates that this research has led to in clinical treatment protocols.
- We will then translate that into the impact on Functional Developmental Behavioral Neuroimmunology and the new therapy and treatment protocols
- Why current certification, or fellowship holders need to continue to update their knowledge and skills with research
- How do you identify the objective measures you can use consistently for clinical reporting?
- What has the research already identified as acceptable measurable findings?
- The importance of measuring objective findings consistently so they are easily able to be recreated/repeated, and don't end up being just anecdotal findings, but rather gain traction/recognition by the research community.

The new standard of care: Turning functional neurology into novel evidence-based therapeutic practice

- How do you identify the objective measures you can use consistently for clinical reporting?
- What has the research already identified as acceptable measurable findings? If we aren't using something we should be, what is it and why?
- The importance of measuring objective findings consistently so they are easily able to be recreated/repeated, and don't end up being just anecdotal findings, but rather gain traction/recognition by the research community.
- How to report the patient's health history when case reporting. What is important to note, and what can be omitted?

References Available Upon Request

TIME: 1 Hour

INSTRUCTOR: Drew Rubin BS, DC, CCSP, DACCP

TITLE: Applying Hemisphericity and Lateralization in a Chiropractic Pediatric Practice.

How the history of handedness created the concepts of brain lateralization. Understanding the asymmetries of the brain, focusing on Autism Spectrum Disorders. Identifying a left or right brain deficiency using Melillo's Master Hemispheric Checklist. Applying your findings to guide the best care for the child/adult with Autism. Examination procedures for determination of hemisphericity, including use of Melillo's Master Hemispheric Checklist (from

Disconnected Kids, 2nd ed.). Considerations while using the Hemispheric Checklist in minimally speaking children/adults with Autism. Application of left-right brain dominance findings in clinical practice.

Key Presentation Points:

1. The evolution of brain asymmetries
2. Brain symmetries associated with Autism
3. Use of the Melillo Master Hemispheric Checklist
4. Special considerations in using the Checklist in ASD
5. Applying hemispheric concepts in pediatric chiropractic adjustive techniques

Supporting Research:

Books:

Disconnected Kids, 2nd Ed. (2015). Melillo
The Lateralized Brain, 2nd Ed (2024). Ocklenburg & Güntürkün
The Master and his Emissary (2019). Iain McGilchrist
The Neuroscience of Psychotherapy (2010). Louis Cozolino

Articles:

Taking Sides: Asymmetries in the Evolution of Human Brain Development in Better Understanding Autism Spectrum Disorder (2022). Leisman & Melillo
Brain Lateralization: A Comparative Perspective (2020). Ocklenburg & Güntürkün
The Development of the Frontal Lobes in Infancy and Childhood (2012). Leisman & Melillo
The Relationship between Retained Primitive Reflexes and Hemispheric Connectivity in Autism Spectrum Disorders (2023). Melillo & Leisman

TIME: 1 Hour

INSTRUCTOR: Michael Hall BS, DC, DABCN, FIACN

TITLE: Tummy Time, is it really necessary?

In this course we discuss the neurological implications of “tummy time” for babies. Why this recommendation first came about and how to drive the areas of the neuraxis more appropriately for healthier development with new and innovative ways to introduce head and eye coordination.

Course Outline:

- What is tummy time really all about?
 - How does tummy time activate the brain?
 - Should it really be necessary for babies to exercise?

Neurodevelopmental trends in research and how tummy time became necessary.

Creating congruency in the head and eye development of the child and its importance for proper growth in the future

Learning Objectives

1. The learner will learn the importance of proper neurodevelopment in children.
2. The learner will understand the importance of teaching parents' good habits and how to utilize chiropractic neurology to improve patient outcomes in neurodevelopment.

References available upon request

TIME: 1 Hour

INSTRUCTOR: Monika Buerger, DC

TITLE:

The neurological sequela of long-COVID is being considered to have the same manifestations of a traumatic brain injury (TBI). This lecture will discuss the current neurological findings patients with long-COVID may present with. It will also discuss the current research literature and findings associated neurological long-COVID with TBIs. General considerations for management strategies will also be discussed. Participants will walk away with a firm understanding of the connection between long-COVID and TBI presentations in patients. They will also be able to better serve this population group with some basic key management strategies.

Key Presentation Points:

What does neurological long-COVID present like
Why is it being considered the same as a TBI
Why is functional neurology important in this population
What are some basic functional screening tests
What are some basic neuronutritional considerations?

References Available Upon Request

TIME: 1 Hour

INSTRUCTOR: Alexander Nelson, DC

TITLE: Functional Neurological Disorder - The what's why's and how's.

FND, once called conversion disorder, is said to be a mental disorder where an individual will have blindness, paralysis and other neurological symptoms.

Teaching points and breakdown of the hour:

- We'll learn what it is
- How it happens
- How to differentiate it from PANS, malingering, and even Munchausen's, or Munchausen's by proxy
- Why it's in our wheelhouse clinically as Functional Neurologists
- What to do
- Quick case study and videos

Reference will be utilized throughout the presentation and available upon request

TIME: 1 Hour

INSTRUCTOR: Michael Longyear DC, DACNB, CCSP

TITLE: Case Studies in Applied Neuroscience

This course will discuss neurophysiology, neuropsychology, and chiropractic neurology through the use of case studies from our clinic. We will focus on concussion, dysautonomia and cardiac related disorders with persistent viral infection symptoms.

Section 1 - Using a case seen in our clinic suffering from concussion, we will look at evaluation, developing a plan and implementation of treatment with patient outcomes.

Section 2 - Using a case seen in our clinic suffering with symptoms of dysautonomia, we will look at evaluation, developing a plan and implementation of treatment with patient outcomes.

Section 3 - Using a case seen in our clinic suffering with long COVID we will look at evaluation, developing a plan and implementation of treatment with patient outcomes.

Learning Objectives

- We will discuss complex cases and how to develop an advanced understanding of methods and procedures to evaluate and treat patients
- Improve flow of ideas in real time working through a case study
- Further develop clinical thinking process and steps

References available upon request

TIME: 1 Hour

INSTRUCTOR: Scharlene Gaudet DC, MSC, DACNB, CCN

TITLE: TBI in the Veteran Population - Applying functional Neurology to this Niche Group

I. Introduction A. Brief Overview of Veteran TBI B. Importance of Effective Therapy for Veterans with TBI

Estimates suggest that between 9-28% of service members, across all branches of the US Military, experienced a TBI during training or service contract. This doesn't even include the statistics from the DOD related to non combat MSK's [non combat musculoskeletal injuries], or those that wash out of each branch's boot camp training. Obviously this is a dire situation not just for the military, but more importantly for the individual themselves. We also know the major challenges related to PTSD post service and the complications for individuals throughout the rest of their lives. Many organizations have stepped in to realize it's imperative the address these injuries and neuro rehabilitation differently. This is where, as Functional Neurologists, we step into the picture related to working with the 'after effects' for these individuals trying to find answers to help themselves.

II. Current Landscape of TBI Therapy for Veterans A. Existing Therapeutic Approaches through the VA B. Successes and Limitations

III. Promising Advances in TBI Therapy A. Emerging Technologies and Innovations B. Collaborations and Partnerships in TBI Treatment

IV. The Role of Rehabilitation A. Rehabilitation Programs Tailored for Veterans B. Family and Community Involvement in the Healing Process

V. Case Studies - A. Sharing Success Stories of Veterans in TBI Therapy

References available upon request

TIME: 2 Hours

INSTRUCTOR: Evan Mladenoff B.Sc., D.C., D.I.B.A.K., F.A.S.A.

TITLE: Dysautonomia in Concussions and mTBI

The Autonomic Nervous System represents a major controlling function of posture, balance and motion. Concussions and head trauma always result in some level of injury to the ANS. Do you have the expertise to evaluate and rehabilitate ANS function in concussions, mild Traumatic Brain Injury, neck pain, headaches, vertigo or athletic performance?

Dr. Evan Mladenoff's presentation consists of two portions dealing with the ANS anatomy and function, classic neurology exam, technology specific examinations, functional neurological examination and treatment strategies. The first section is an exploration into current ANS chiropractic, medical neurology and functional neurological exam protocols. The second section of the presentation introduces heart rate variability (HRV) technology as part of the examination protocol. The third section is an exploration into the functional neurological evaluation and treatment of the ANS. Workshop implementation of protocols will be demonstrated and implemented with attendees. The fourth section is multi-dimensional treatment strategies to rehabilitate ANS function. These examination and treatment strategies are applicable for Mild Traumatic Brain Injury, neck pain, headaches or degenerative disease patients.

The attendee will walk away with a greater understanding of ANS function, examination protocols and treatment strategies related to dysautonomia from concussions and mild traumatic brain injury. These protocols are equally applicable to any neck, balance, stress and degenerative disease patients.

Key Presentation Points:

- a) The increasing prevalence and dysautonomia.
- b) The impact concussions have on the Autonomic Nervous System
- c) Examination protocols from multiple disciplines
- d) Functional Examination protocols for the Autonomic Nervous System (ANS)
- e) The unique treatment spectrum – including manipulation, nutrition, laser therapy, neurofeedback and acupuncture to support and rehabilitate the Autonomic Nervous System.

References available upon request

TIME: 1 Hour

INSTRUCTOR: Ryan Cedermark RN, BSN, MSN, FNP-C, DC, DACNB

TITLE: Novel Therapeutic Application for Stroke Recovery

Mainstream therapy for stroke recovery currently consists of physical therapy, occupational therapy, speech therapy, etc. Research is proving that utilizing bioelectric stimulation of specific cranial nerves in addition to other non-invasive modalities (laser therapy) can enhance efficacy of treatment and help patients break through current rehabilitation plateaus. Understanding how to apply multiple noninvasive stimulation methods adjunct to physical stimulus is key in stroke recovery.

Participant will learn:

Participants working with stroke patients will be able to confidently apply simple modalities to improve clinical outcomes after the lecture. This work is extremely important because many therapists working with this population do not understand the power of neuroplasticity when stimulating key cranial nerves.

Key points:

- 1. Introduction to stroke: Neuroanatomy
- 2. Common deficits seen in stroke
- 3. Simple application of laser therapy in stroke
- 4. Electric stimulation coupled with mirror therapy in stroke
- 5. Combining multiple sensory modalities to improve stroke recovery

Article:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10046557/>

TIME: 1 Hour

INSTRUCTOR: Avishai EI

TITLE: How A Traumatic Brain Injury Saved My Life

The lessons learned from having a traumatic brain injury - a case study presentation. Experiencing a TBI as a Holistic Health Coach, with a vast background in the medical field, had me search for clinical strategies that would have symptom impact in the short term, and more importantly allow the healing through working with other health practitioners. Strategies when working with any TBI or concussion must be in a clinical environment where you test, monitor, and retest any individual - no 2 cases are the same. This requires a strong emphasis on the ability for any practitioner to modify their standard of care, or specific protocols, to fit the clinical picture for any patient.

Key Presentation Points:

- Brain Injury diagnosis and clinical plan
- Clinical strategies to create a strong protocol - define this protocol, how to monitor clinical responses
Nutrition Impact - where does this fit in with the above protocols
Nervous System monitoring through technology and symptomatology

TIME: 1 Hour

INSTRUCTOR: Barbara Eaton DC

TITLE: The Surprising Neuroscience Driving Communication and Deep Understanding In Health Care Practice

This presentation, tailored for the field of Functional Neurosciences, dives into the critical yet often overlooked aspect of communication within healthcare. Highlighting the unique intersection between neurological conditions and patient interactions, it addresses the substantial gap in traditional health care training regarding effective patient communication. With my background emphasizing the necessity of this skill for enhancing clinical outcomes, we'll be exploring strategies to forge deeper connections with patients through ensuring psychological safety and deep understanding. This focus not only promises to revolutionize patient care but also positions itself as a pivotal topic for continuing education, especially given the nuanced needs of those affected by neurological conditions. Through this presentation, participants will be inspired to harness the power of empathetic communication, unlocking new pathways to healing and transforming their approach to patient engagement in the realm of Functional Neurosciences.

We can only heal humanity if we can effectively and efficiently communicate with them in ways that matter to them. Most health care professionals receive little to no training and practice in this vital endeavor, which is why this presentation will be extremely impactful. Participants will walk away feeling energized and encouraged about the vast opportunities to connect on a deeper, more meaningful level with their patients leading to superior clinical outcomes.

Key Presentation Points:

Objectives:

- Demonstrate The Primary Neurological Structures Involved In Communication And Deep Understanding
- Provide Overwhelming Evidence That Supports A Neurological Approach To Education Versus A Behavioralist Approach
- Outline The Vital Components To Communicate In A Neurologically-Friendly Manner

- * Understand the implications of Thomas Boyce's work in practice to ensure "orchids" aren't in a constant amygdala hijack and thus unavailable for learning and thus healing
- * Given how disconnected the world is, we are in need of a connection pathway and brain health is exactly that

Description and Supporting Research:

- * Brain centric Design by Carr and OMahony
- * Brain-centric Design Reverses the Ebbinghaus Forgetting Curve: Transforms a Learning Community Immediately and Forever. Neurotherapeutics. 2020
- * A Comparison of Lecture-Based and Challenge-Based Learning in a Workplace Setting: Course Designs, Patterns of Interactivity, and Learning Outcomes. Journal of the Learning Sciences, 2012

TIME: 1 Hour

INSTRUCTOR: Christopher Connelly, DC

TITLE: Pathophysiology of Post-Concussion Syndrome

Pathophysiology of Post-Concussion Syndrome is great clinically and important to understand. How to prevent the secondary functional changes in the brain that lead to PPCS & neurodegenerative changes.

Traumatic brain injury (TBI) is a neurophysiologic event experienced by an estimated 1.7 and 3 million people in the United States every year. CDC: traumatic brain injury/concussion. [Aug; 2023]. 2023 & Capizzi, A.; Woo, J.; Verduzco-Gutierrez, M. Traumatic Brain Injury: An Overview of Epidemiology, Pathophysiology, and Medical Management. Med. Clin. N. Am. 2020, 104, 213–238. Mortality across all TBI severities is approximately 3%. While TBI is well known to cause cognitive, motor, and behavioral symptoms, both acutely and as long-term complications, its morbidity is difficult to quantify. Although most TBI is characterized as mild, even these less severe head injuries can bring long-term sequelae. Nguyen, J.V.K.; McKay, A.; Ponsford, J.; Davies, K.; Makdissi, M.; Drummond, S.P.A.; Reyes, J.; Willmott, C. Interdisciplinary Rehabilitation for Concussion Recovery (i-RECOVer):

Protocol of an investigator-blinded, randomised, case series with multiple baseline design to evaluate the feasibility and preliminary efficacy of a 12-week treatment for persistent post-concussion symptoms. Pilot Feasibility Stud. 2022, 8, 198. Mild traumatic brain injury (TBI) and concussion can have serious consequences that develop over time with unpredictable levels of recovery. Millions of concussions occur yearly, and a substantial number result in lingering symptoms, loss of productivity, and lower quality of life. Rauchman SH, Pinkhasov A, Gulkarov S, Placantonakis DG, De Leon J, Reiss AB. Maximizing the Clinical Value of Blood-Based Biomarkers for Mild Traumatic Brain Injury. Diagnostics. 2023; 13(21):3330. <https://doi.org/10.3390/diagnostics13213330>

TBI can cause short- or long-term issues that may affect a person's life, such as the inability to work or resume social activities. Many patients with TBI experience impairments in daily life and a decrease in quality of life for an extended period, impeding their return to work or school. Cuthbert JP, et al. Unemployment in the United States after traumatic brain injury for working-age individuals: Prevalence and associated factors 2 years postinjury. J. Head Trauma Rehabil. 2015;30:160–174. doi:10.1097/HTR.000000000000090.

Even with mild TBI (mTBI), commonly known as concussion, which accounts for 70–90% of all TBI cases, the morbidity is substantial. Levin HS, Diaz-Arrastia RR. Diagnosis, prognosis, and clinical management of mild traumatic brain injury. Lancet Neurol. 2015;14:506–517. doi: 10.1016/S1474-4422(15)00002-2.

mTBI can result in acute symptoms, including headache, dizziness, irritability, fatigue, cognitive difficulty (e.g., attention and memory), and sleep disturbances. In most patients with mTBI, these symptoms resolve within days to weeks after the injury; however, some patients develop persistent physical and neuropsychiatric symptoms called post-concussion syndrome (PCS). Carroll LJ, et al. Prognosis for mild traumatic brain injury: Results of the WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury. J. Rehabil. Med. 2004;43:84–105. doi: 10.1080/16501960410023859.

Reportedly, up to 40% of the patients with mTBI have symptoms persisting for more than 6 months. Voormolen DC, et al. Divergent classification methods of post-concussion syndrome after mild traumatic brain injury: Prevalence rates, risk factors, and functional outcome. *J. Neurotrauma*. 2018;35:1233–1241. doi: 10.1089/neu.2017.5257. Mikolić A, et al. Prediction of global functional outcome and post- concussive symptoms after mild traumatic brain injury: External validation of prognostic models in the collaborative European NeuroTrauma effectiveness research in traumatic brain injury (CENTER-TBI) study. *J. Neurotrauma*. 2021;38:196–209.

Key Presentation Points:

The TBI epidemic
Pathophysiology of TBI
TBI management

More references will be reviewed

TIME: 2 Hours

INSTRUCTOR: DeAnn Fitzgerald, OD

TITLE: Concussion Chronicles: Deciphering the Vision Impact

Vision trumps all senses. In the beginning we are an integrated dorsal stream of peripheral vision, vestibular and neuromuscular movers. Sensory (vision, auditory, tactile) and motor systems must work together to drive movement. It is essential to note that the brain and individual structures, systems, and pathways presented therein directly impact our success as movers. Let's explore the concept of neuroplasticity, and how a better understanding of its underlying principles improves rehab outcomes.

Reinjury rates following return to sport are often quite high. In under-25 athletes for example, the incidence of another anterior cruciate ligament (ACL) rupture (or ACL failure) run as high as 23% (1). The reasons for reinjury when returning to sport are multifactorial. One of the more recent identified factors, the mapping of the visual-motor loop. So the systems need to be remapped because the individual has retained and not retrained the sensory and motor systems that control the aberrant movement patterns in the recovering athlete. Despite attempts at best practice rehabilitation of athletes, the utilization of motor control principles – specifically the principles of neuroplasticity – is frequently neglected.

Teaching Categories and Sections:

- prevalence
- what constitutes a concussion
- Vision the unsung hero
- Impact on recovery through Autonomics, motor and vision
- Bigger than the triad—cerebellum, brainstem ,frontal---basal ganglia, parietal, insula
- Tool and techniques on diagnosis management and treatment
- Multidisciplinary approach
- Brain based therapies to help your patient get better faster
- Success stories, challenges, and lessons learned

Reference available upon request

TIME: 1 Hour

INSTRUCTOR: Michael Kessler B.A., D.C., C.C.S.P., NTP

TITLE: Looking under the hood with advanced tech to track neuroinflammation

There are thousands of pub med articles on HRV in the neuroscience field and we will review how important it is to understand population size and caliber in making clinical decisions - particularly on making clinical decisions with when it is safe to return to work or athletic activities. Teaching clinicians how to objectively track health metrics. objectively on multiple levels - including measure HRV, Brain Function and Cellular Health, inflammation and have indications for minerals, neurotransmitters and more. Our clinical protocols have been designed based on the collaboration with Brain Neuroscientists, Chiropractic, and NMD .

Clinical Research will be shown - how In 5 minutes of measuring on an ECG you get a baseline on the patient's health status that is easy to visually see for you and your patients that will show the patient exactly where their health is at and if the treatments they are receiving are improving their resiliency and ability to adapt to all stress. If the ANS has lost its ability to respond to stress and the patient has decreased Vagal tone they will have trouble healing no matter what is done. We will also be able to track brain function and be able to show improvement in 20 minutes without using EEG technology. We can also use this technology for brain training.

Key Presentation Points:

The effects of stress on the ANS, immune system and brain.

How to interpret and measure the effects of all stressors on the functional HRV system, brain percept testing, and BIA combined.

Suggestions on how to clinically report results and create protocols and timelines to continue to report change in health conditions for patients.

TIME: 2 Hours

INSTRUCTOR: Mike Alden, DC

TITLE: Biomarker Testing and Nutritional Treatment Strategies following Traumatic Brain Injury and for the Prevention of Neurodegenerative diseases related to CTE

Outline for 2 hour presentation:

0:00-0:20 **Overview – understanding the role of the blood-brain barrier in health and disease**

The blood brain barrier (BBB) is a physical barrier between the brain and the circulating blood, formed by the arrangement of endothelial cells and tight junctions that line the capillaries, which supply blood to the brain. It is a highly selective barrier that restricts the movement of all soluble proteins greater than 400 Da from the blood across to the brain. Acting like a filter, the BBB protects the brain from infections, the products of infections such as lipopolysaccharides (LPS), and toxic chemicals, etc., that circulate in the blood. The BBB naturally permits the passage of essential metabolites, small hydrophobic (lipid soluble) molecules like oxygen, carbon-dioxide, hormones, etc. When the BBB is damaged it provides a gateway for environmental triggers to infiltrate the brain and nervous system. Due to the similarity between some of these triggers and neurological tissues, neuro-reactive antibodies can be formed. Neuronal autoantibodies contribute to the onset of neurological diseases.

BBB dysregulation plays a role in many neurological disorders, for example:

- faulty BBB clearance of potential brain toxins in Alzheimer's disease and Parkinson's disease
- inefficient clearance of excitotoxins across the BBB after an ischemic insult or TBI
- increased transport of leukocytes across the activated BBB in multiple sclerosis, AIDS dementia, and Alzheimer's disease, and during neuroinflammatory CNS responses
- BBB breakdown in amyotrophic lateral sclerosis, Alzheimer's disease, epilepsy and multiple sclerosis.

BBB breakdown may precede, accelerate, exacerbate or contribute to chronic disease processes in neurodegenerative disorders of the adult and aging nervous system.

0:20-0:40 **Food as trigger of neuroautoimmunity**

During traumatic brain injury (TBI), the BBB fails and allows for the invasion of neuronal tissue-binding food proteins and cross-reactive food protein antibodies into the once protected nervous system. Specific proteins, such as gliadin and milk butyrophilin share homology with human asialoganglioside, myelin, cerebellum, synapsin. Corn, soy, spinach and tomato aquaporins share homology with the aquaporin, in the astrocytic foot process. When a patient eats these foods and generates antibodies to the food proteins, in some patients with a broken BBB, these infiltrating food antibodies can mistake neurological tissue as the food protein and therefore tag it for destruction. Upon the destruction of neurological structures, neurological tissue protein waste in circulation will spur the production of antibodies against self-tissue. Which can be measured with serum biomarkers for autoreactive neurological antibody testing.

Other foods can bind to BBB proteins and myelin. Wheat germ agglutinin (WGA), lentil lectin and bean agglutinins bind to myelin tissue, while WGA can also bind to sialic acid and N-acetylglucosamine, which induces vesicle-mediated internalization of WGA by brain endothelial cells, a process called adsorptive endocytosis. Upon binding to tissues, the tissues can become damaged. Neurological tissue protein waste in circulation can trigger the development of autoantibodies. This can be followed by neurological disease and neurodegeneration.

0:40-1:00 **Modern assessment for broken BBB**

A broken BBB can be assessed by clinical judgement of case presentation, GABA challenge, SCAT or through blood antibody measurements. "The blood doesn't lie." With advanced serologic testing now available, quantitative assessments can be obtained at baseline and during treatment to verify treatment protocols are effective and/or when the barrier is healed.

1:00-1:45 **TBI diet and BBB healing protocols**

The cascade of physiological events that occur immediately following the disruption of the BBB create neuroinflammation, cytotoxic and chemotoxic reactions along with the destruction of neural tissues and local supporting structures. It is important to quench the inflammatory process and modulate the immune reactions as quickly and efficiently as possible following a TBI. The immune response of TH1, TH17 and Cytokine Inducible Nitric Oxide Synthase can all be modulated through specific botanicals, compounds and cofactors that have been proven effective in both research and clinical practice. Dietarily, it is possible to strengthen the BBB by promoting a healthy intestinal barrier, thus reducing the possibility of lipopolysaccharides (LPS) to be present in the blood. LPS have been shown to cause a weakened BBB, which further illustrates the gut-brain/brain-gut connection. Baseline testing for intestinal barrier permeability could be instrumental in helping to prevent BBB disruption during contact sports, if the intestinal barrier is maintained as healthy.

1:45-2:00 **Case Study Presentations**

Case presentations to show the effectiveness of using nutrition and treatment protocols on persons with TBI/CTE.

References available upon request

TIME: 1 Hour

INSTRUCTOR: Krista Burns, DC, CPEP, DHA

TITLE: Post Concussion Syndrome and Brain Based Postural Correction

This presentation is important for the field of functional neurology because it correlates the link between concussion, neurology, and posture. Practitioners will gain practical insights of brain based posture assessments and brain based correction solutions they can implement with their patients who are suffering from post concussion syndrome.

If postural stability is compromised in post concussion syndrome patients, they may be prone to another injurious fall.

This presentation will inform practitioners of the important role of the oculomotor, vestibular, and somatosensory systems for postural stability and how to detect postural instability for safe return to play.

The Center for Disease Control estimates that 5-10% of athletes will experience a concussion in any given sports season. Estimates suggest that up to 50% of sports related concussions go unreported. The incidence of concussion in sport has been steadily increasing over previous decades (Hallock et al., 2023).

What will a participant walk away with from your presentation? Distinctions of 'how' this can apply to their practices, to research in this field, etc. Be specific with clinical distinctions or 'why' this work is so important.: Practitioners will walk away with an evidence-based review of the correlation of posture and post concussion syndrome, and practical application of brain based posture assessments and brain based postural correction solutions to incorporate with their current clinical protocols.

Key Presentation Points (5-7 content categories):

1. What is Post Concussion Syndrome
2. Evidence-based research review of the connection between posture and posture concussion syndrome
3. Neurophysiology overview of the neurology that controls the Posture System
4. Brain based posture assessments for patients with post concussion syndrome
5. Brain based postural correction for patients with post concussion syndrome

References Available Upon Request

TIME: 1 Hour

INSTRUCTOR: Christopher Connelly DC, CCSMS, CBIS, CIR

TITLE: From care to court - Impairment Ratings in TBI.

Traumatic Brain Injury (TBI) - The Brain Injury Association of America defines a TBI as “an alteration in brain function, or other evidence of brain pathology, caused by an external force.” TBI is a complicated injury. Every patient is different. Diagnosis is often missed or not treated. Most jurors, lawyers & doctors don't understand. A critical factor in head injury diagnosis assessment is what we call the 'impairment rating' - not just for the evaluation stage yet this impacts even more the treatment timelines and recommendations, and then mostly return to work or return to play in a sport - the timeline is different depending on the severity rating.

Impairment evaluation requires medical knowledge; therefore, mostly doctors who are qualified in allopathic or osteopathic medicine or chiropractic medicine use the Guides to evaluate permanent impairment.

Lecture Objectives:

1. TBI resources & awareness – it's “a silent epidemic” that is often missed in clinical practice. What are some good resources?
2. Develop a clinical understand of the common subtypes of Traumatic Brain Injury. (including the upper cervical spine).

3. Brief overview of The American Medical Association: Guides to the Evaluation of Permanent Impairment 6th edition for TBI cases.

4. Overview of the VA disability ratings & life plans.

5. Proper documentation & prepare for trial or depositions.

Research available upon request.

TIME: 1 Hour

INSTRUCTOR: David Boynton, DC, FIBFN-FN

TITLE: Functional Neurology and Athletes: Strategies for Rehab and Performance

In this presentation Dr. Boynton will discuss the use of various modalities that assist the functional neurologist in care of athletes. To begin we will build a framework on how to reach an accurate mTBI diagnosis - 5 core categories Next we look at how to monitor progress through the return to play decision. To complete the discussion we will look at how the same modalities can be used to optimize performance in the athletic setting. Balance, vision, vestibular and cognitive metrics will be discussed.

Key teaching points:

- mTBI assessment: how much is enough
- the critical role of vision and balance in creating optimal performance
- using EEGs to track performance outcomes

References available upon request

TIME: 1 Hour

INSTRUCTOR: Dominic Fetterly BS, DC, DACNB

TITLE: Movement and The Brain

This course will discuss networks in the brain involved in movement as well as concepts that may be helpful to understand why movement is so important as a supportive role for patient care.

What will a participant walk away with from your presentation? Distinctions of 'how' this can apply to their practices, to research in this field, etc. Be specific with clinical distinctions or 'why' this work is so important.

In this seminar, learners will gain insight on the importance of movement from a neurophysiological perspective. Movement is something that can benefit all people, we will delve into the reasons it can help our patients on our way to achieve or to sustain healthy brain function. This presentation will equip doctors with information to share with patients to feel confident prescribing movement along-side care for brain health.

Key Presentation Points (5-7 content categories)

1. Physical activity vs Sedentary
2. Neuronal survival and cognitive reserve
3. Neural networks for movement
4. Clinical measures of neural networks
5. Different exercise types for different goals

Request available upon request

TIME: 1 Hour

INSTRUCTOR: Stephanie Sullivan DC, PhD

TITLE: Review of the brain-based chiropractic neuroplasticity research

This research talk will provide a foundational discussion regarding the neuroscience assessment technologies being employed in the chiropractic neuroscience research field and review the present state of brain-based chiropractic neuroplasticity research, highlighting key articles.

This research presentation will provide the audience with the tools needed to understand the strengths and limitations of the technology being utilized in the chiropractic neuroscience research field. The review of the literature and discussion of key articles will provide the listener with information that they can share with their patients and leverage as they develop interventions unique to their patients.

Key Presentation Points:

- * Strengths and weakness of the technology being used in the chiropractic neuroplasticity research.
- * Synopsis of the brain-based chiropractic neuroplasticity research
- * Review of brain regions such as the anterior cingulate cortex and prefrontal cortex that highlight changes in resting state brain activation patterns across multiple research studies.
- * Relationship between the regions showing neuroplastic change with chiropractic and brain function.
- * Overview of the present state of the brain-based neuroscience research.

TIME: 1 Hour

INSTRUCTOR: David Hanscom, MD

TITLE: Are RUTs (repetitive unpleasant thoughts) the Driver of Chronic Disease

Repetitive unpleasant thoughts (RUTs) reflect the body's threat physiology and also drive it. We have no protection from mental pain and for many people, the intensity drives mental and physical pain. Although patients improve with many interventions, it is not possible to truly heal and resolve chronic physical symptoms without addressing the mental component. There is abundant research regarding thought suppression, its impact on the body, and dysfunctional behaviors. We have known for decades that chronic stress causes illness and disease.

Key Presentation Points:

- understand the nature of threat physiology
 - present the portals for lowering it - input, the nervous system, and output (physiology)
 - The framework is called, "Dynamic Healing"
 - Understanding these concepts allows clinicians to focus on their role in treating chronic disease. It is a complex problem, but breaking it down allows it to be solved.
- RUTs are considered unsolvable and just to be managed. By learning to autoregulate stress physiology, it is solvable.

References available upon request

TIME: 1 Hour

INSTRUCTOR: Jason Smith DC, MS FABVR, FACFN, DACNB, FABBIR

TITLE: Treatment Considerations for Parkinsonism

A case study of a patient who suffered rib fractures from a fall. He had been previously diagnosed with Parkinson's and eventually Benson's disease (dementia). What I learned clinically and the improved breathing, gait, and coordination he experienced over a short time.

Clinical approaches that are safe and effective in improving gait, speech and smoothness of movement in Parkinsonian and other neurodegenerative conditions. Improvements in these also improve the social and emotional state of the patient.

Key Presentation Points:

Discussion of the three main categories of neurodegeneration
Importance of taking rib expansion measurements
Seated rib manipulation considerations for breathing and postural improvements
Supine exercise considerations
Metronome considerations for therapeutic effects

References available upon request

TIME: 1 Hour

INSTRUCTOR: Karla Mehlenbacher, DC, DACNB, FABBIR, FIBFN-CND

TITLE: Wifi on the Brain

Changes induced by pulsed electromagnetic frequencies accumulate over time have harmful long-term biological impact. All nervous system based practitioners should be aware of the damages of constant exposure to pulsed electromagnetic frequencies and educate their patients of the harmful effects it may be having on their health. I believe this conversation is relevant to all population types.

KEY CONCEPTS: Prevention. Limit exposure. Educate patients. Informed consent.

Key Presentation Points:

Changes induced by pulsed electromagnetic frequencies accumulate over time, with harmful long-term biological impact.

Pulsed electromagnetic frequencies effects on brain development.

WiFi's interaction with signaling channels in the human brain. Calcium channels, voltage-gated sodium, potassium, and chloride channels are all shown to be activated by pulsed electromagnetic frequencies.

Mineral ratios within the nervous system

Potential ways to test - HTMA, minerals, heavy metals, environmental screenings, city reports

Tools and resources to limit exposure

References available upon request

TIME: 1 Hour

INSTRUCTOR: Brandon Brock, DNP, DC, MSN, APRN, NP-C, DACNB, DCBCN, FICC, BCIM

TITLE: Emerging Neurological Disorders in the Era of COVID

The seminar titled "Medicine in the Post-2019 Era" addresses the profound impacts of COVID-19 on neurological health and the medical community's evolving response. Key topics include

the significant effects on the hippocampus, the challenges of long-term COVID-19 neurological injuries, and the pathophysiology of neuro-COVID and post-vaccine injuries. Discussions also

cover the mechanisms behind spike protein-related injuries, cognitive disorders like brain fog, and potential biomarkers for Alzheimer's in the context of COVID-19. The seminar further explores long-term brain injury markers, the diagnosis and treatment of chronic neuroinflammation, and conditions such as autoimmune encephalitis, POTS, and dysautonomia post-COVID. Treatment strategies focus on improving immune response, addressing micro clotting, and harnessing neuroplasticity for recovery. Overall, the seminar aims to equip healthcare professionals with a comprehensive understanding of the multifaceted neurological consequences of COVID-19 and to foster an informed approach to treatment and patient care in the post-pandemic era.

Specific Topics: (Each divided throughout a One-hour lecture):

1. Medicine in the Post-2019 Era: This session explores the changes in medical practice and patient care dynamics since the COVID-19 pandemic, emphasizing new healthcare challenges and innovations.
2. The Hippocampus May Have Been Hit the Hardest: This topic delves into research findings that suggest the hippocampus, a critical brain area involved in memory and learning, has been significantly affected by COVID-19. This could potentially explain some cognitive symptoms experienced by patients.
3. How Do We Treat Long-Term COVID-19 Neurological Injuries? The discussion centers on therapeutic approaches and clinical strategies for managing long-term COVID-19 patients' neurological sequelae, including pharmacologic and non-pharmacologic interventions.
4. What Causes Neuro-COVID and Post-Vaccine Injury? This session examines the pathophysiology behind neurological manifestations following COVID-19 infection and vaccination, exploring direct viral effects and immune-mediated responses.
5. Spikeopathy Mechanisms of Injury: This section investigates how SARS-CoV-2 spike proteins contribute to cellular damage, focusing on the mechanisms through which these proteins impact neurological function.
6. Brain Fog and Cognitive Disorders: Offers insights into the cognitive impairments such as brain fog seen in COVID-19 survivors, discussing potential underlying mechanisms and impacts on daily living.
7. Biomarkers for Alzheimer's: Explores the latest advancements in biomarker research for Alzheimer's disease, discussing how these markers can also be relevant in the context of COVID-19-associated cognitive impairments.
8. Long-Term Brain Injury Markers in COVID-19 Survivors: Identifies biochemical and imaging markers that can indicate long-term brain injury in COVID-19 survivors, highlighting the importance of these markers in diagnosing and managing long-term health issues.
9. Evaluation for Brain Fog / MCI / Cognitive: This section discusses diagnostic strategies and tools for assessing cognitive impairments, such as Mild Cognitive Impairment (MCI) and brain fog, in post-COVID patients.
10. Chronic Neuroinflammation is the Downfall of the Brain: Analyzes how persistent neuroinflammation can lead to progressive neurological decline, exploring mechanisms and potential therapeutic targets.
11. Autoimmune Encephalitis: Over 50% are autoantibody negative: Addresses the complexities of diagnosing and treating autoimmune encephalitis when traditional biomarkers like autoantibodies are absent.
12. Multiple Mechanisms in POTS Post-COVID: This session focuses on Postural Orthostatic Tachycardia Syndrome (POTS) following COVID-19, discussing the diverse physiological mechanisms involved and their implications for treatment.
13. Dysautonomia/EDS: Reviews the link between dysautonomia and Ehlers-Danlos Syndrome (EDS) in the context of COVID-19, providing insights into the challenges and treatment options.

14. Associated Treatments: This section highlights various treatment modalities, including existing and experimental therapies, that have shown efficacy in managing the long-term effects of COVID-19.

15. Improve the Immune Terrain: This approach emphasizes strengthening the immune system through lifestyle changes and medical interventions to manage better and prevent post-COVID complications.

16. Address Micro Clotting: Discusses the occurrence of micro clots in COVID-19 and strategies to diagnose, manage, and treat these potentially life-threatening occurrences.

17. Neuroplasticity: The Brain That Changes Itself: This conference concludes with a session on neuroplasticity, offering hope through the brain's ability to rewire and heal itself, which is crucial in recovering from neurological damage due to COVID-19.

Each of these topics is designed to provide healthcare professionals with a thorough understanding and practical knowledge, aiding them in better serving patients who continue to suffer from the long-term effects of COVID-19.