Association of NJ Chiropractors
Proudly presents

“Functional Neurology and Chiropractic”

With

Michael W. Hall, DC, CCST, DABCN, FIACN
October 31 / November 1, 2015
Goal and Objectives

• Goal: to better appreciate the application of functional neurology to the chiropractic practice

• Objective(s):
  • 1. to improve the practice of chiropractic thru better understanding of the nervous system
  • 2. implement functional neurology procedures into a busy practice
  • 3. improve patient outcomes, retention, and referrals
  • 4. have fun learning
Books

- Principles of Neural Science – Kandel and Schwartz
- Principles of Neurology – Adams and Victor
- Clinically Oriented Anatomy – Moore Sacks, Cytowicz, Ramachandran, etc.
The Blue Zones
The spine is to your brain like signal is to your cell phone.
Your Brain

- Asymmetrical
- Males / Females are different!
- Exams and Care Plans should note the difference
- Stress / Sitting / Sleep Deprivation / Screen Time
- Being preventative and pro-active are the keys to a healthy functioning Brain
- Bioengineering model – upright, weight-bearing, and moving in a cross-crawl manner
Stress

• What is it?
• How do we see it in Practice?
• Sleep?
• Eating Habits?
• Exercise?
• Happiness in Life?
Stress may be defined as a threat, real or implied, to the psychological or physiological integrity of an individual.
What does “stress” mean to you in clinical terms?

• Interference in the nervous system
• 3 T’s
• “above down, inside out”
• History
• Exam
• Diagnosis
• Care
Consider Outcomes

- VAS
- NDI, Roland-Morris, SF 12 / 36, FRI
- Wong-Baker FACES scale
- Oxford Happiness Inventory
- Subjective Happiness Scale
- Promis 29, Well-Being Initiative
Stress

• The primary hormonal mediators of the stress response, glucocorticoids and catecholamines, have both protective and damaging effects on the body.

• In the short run, they are essential for adaptation, maintenance of homeostasis, and survival (allostasis). Yet, over longer time intervals, they exact a cost (allosstatic load) that can accelerate disease processes.
The concepts of allostasis and allostatic load center around the “brain” as interpreter and responder to environmental challenges and as a target of those challenges.
Salivary Cortisol and DHEA

Cortisol
Reference Range
1 Hour After Rising
7AM - 9AM:
0.27-1.18 mcg/dL
11AM - 1PM:
0.10-0.41 mcg/dL
3PM - 5PM:
0.05-0.27 mcg/dL
10PM - 12AM:
0.03-0.14 mcg/dL

Hormone
Reference Range
DHEA 7am - 9am
<10
71-640 pg/mL
DHEA: Cortisol Ratio/10,000
NR
115-1,188
Thyroid symptoms occur when excess cortisol blocks production of TSH or prevents conversion of T4 to T3. These symptoms may include: fatigue, cold intolerance, weight gain, memory problems, poor concentration, depression, hair loss, dry skin, infertility.

When cells get the T3 hormone they need, the body is healthy and works as it should.
“Since prolonged physical inactivity can have devastating effects on the body all by itself, it should be considered a disease.”

Dr. Michael Joyner, Mayo Clinic
Sitting Hurts

2X Greater Risk Of Diabetes

90% Greater Risk Of Cardiovascular Disease

49% Greater Risk Of All-Cause Mortality

Sources:
Katmarzyk BMJ Open, 2012
Wilmot, Diabetologia, 2012
Subluxation represents “interference” in the nervous system

• Are we okay with this? Subluxation v. Vertebral Subluxation

• What represents interference in the nervous system?
  • Blood pressure
  • Heart rate
  • Pain

• From a neurology perspective, what is the purpose of the adjustment and what is its’ relevance to the care plan?
  • Pain relief
  • Functional restoration
Stress

- Shrinks your brain, especially the frontal lobes, hippocampus, and areas of the parietal cortex.
- Chronic pain is considered a stressor!
- Rapid, shallow breathing is a stressor!
“I fear the day that technology will surpass our human interaction. The world will have a generation of idiots.”

Albert Einstein
What is Functional Neurology?

• A method of application and analysis utilized to assess patient needs, develop outcome metrics, improve quality of care, and drive research initiatives.

• Chiropractic has been buried in a primarily “pain-based” or orthopedic model which has as it’s focus primarily the joint or end organ tissue. ie – P.A.R.T.

• Functional Neurology looks at central and peripheral neurologic inter-relationships as they relate to human function. Consider that nerve problems are preceded by nerve root dysfunction, axial before appendicular, rostral before caudal, balance before coordination, etcetera.
Orthopedic / “Pain-Based”

- Chief Complaint
- History – OPQRST
- Exam – Provocative
- Diagnosis – “-algia, -itis, -ago”
- Management – “SPA”, pain reduction
- Outcome Metrics – NDI, revised Oswestry, ADL scales
- Pros – primary market for many chiropractors, reimbursement scales, practice guidelines
- Cons – very competitive, economic burden, trend towards chronicity

“Brain activates flexor muscles to withdraw from pain”
NDI & Cerebral Perfusion

Increased Score = Decreased Perfusion to Parietal / Frontal lobes
Functional Neurology

• Looks at the neuraxis, both vertically and horizontally for a causal relationship
• Addresses – sensory, motor, autonomic, and cognitive domains
• Requires greater working knowledge of physiology and anatomy
• Less qualitative focus on pain but not less empathetic to the patient
• More focus on function and future impairment
• Pros – newer concept, growing patient population, increasing opportunities
• Cons – requires greater applicability of neurology, anatomy, and physiology; may challenge beliefs and current practices and standards
Functional Neurology

• Identify the “LLL”
  • End organ
  • Receptor
  • Peripheral Nerve
  • Spinal cord
  • Brainstem (caudal / rostral)
  • Cerebellum
  • Thalamus
  • Cerebral Cortex

• Brain – considerations
  • Majority of output from brain is ipsilateral
  • Majority of input to brain is contralateral
  • Volitional control is primarily contralateral brain while stabilization is primarily ipsilateral
  • Brain inhibits flexors and sympathetics
  • We have to activate extensors and parasympathetics
Functional Neurology

- Identify level of dysfunction and/or interference
- Identify the vertical and then horizontal level
- Devise a management plan to address the dysfunction

Ex:
The patient exhibits dysfunction in the right Cerebellum which is manifesting as lower back pain, left multifidi imbalance, and right facet arthropathy.

Plan:
Adjust spine to remove subluxation (? Technique), increase activation of right cerebellum and left cortex thru right upper extremity activities with lumbar stabilization, i.e-right arm raises, left pursuits with head tracking.

NB – contractile proteins of muscles have a half life of 6-10 days.
What’s in a head tilt?
Brain dictates motor function
Brain (frontal lobe)

• Inhibits Flexors (flexor, adductor, internal rotator, pronator)

• Inhibits Sympathetics

• Behaviour - Frontal Lobe – service oriented, others centered; Temporal Lobe – self centered, selfish
Do you take lateral flexion films?
3 wks follow-up
Little bit of research

• “Chronic back pain is associated with decreased prefrontal and thalamic gray matter density” The Journal of Neuroscience, Nov. 17, 2004


• Cerebral Perfusion in Patients with Chronic Neck and Upper Back Pain: Preliminary Observations. JMPT 2012; 35: 76-85
Vitals Signs are VITAL!!!!

• Blood Pressure
• Heart Rate
• Respirations
• Oxygen Saturation
• Temperature

• Make sure you get them done! 😊
Oximeters

- Massimo / iPhone 5
- Nonin 9590
- GE TuffSat
PMRF / Brain Summary Assessment

- Posture
- BP (bilaterally)
- Pupils / Light Reflex (dystaxia)
- Palate / Extensor Tone
- Palpate extremities for Moisture
- Pyramidal Weakness
- Heart rate / Perfusion Index
- Skin Temp
- Bowel Sounds
- Fundus
Procedures

- Head Tilt – hypertonic scm
- Posture – soft sign – ipsi cortex -> int arm, ext foot
- Pyramidal Weakness – weakness on side of deficient cortex
- Muscle Testing – weakness with eyes closed when looking towards weak cortex
- Turn Test – turn towards side of weak cerebellum / opposite cortex
- Finger to Nose – past point on side of cerebellar deficiency
- Vitals – elevated on side of weak cortex – blood pressure
Tests / Procedures

- Romberg
- Mann’s / Tandem Stance
- Tandem Gait
- Fukuda Step Test
- Pyramidal Weakness
- Finger to Nose
- Pronator Drift
Romberg
Step Test / Turn Test / Fukuda Test
Pyramidal Weakness

• The Pyramidal Presentation - lack of thalamic activation to prefrontal cortices leads to a decreased ipsilateral activation of shunt and proximal limb stabilizers allowing flexor escape and contractures.

• What this really means is that the patient has decreased extensor stabilization on one side.

• Check the distal finger extensors and hallux dorsiflexion.
Pyramidal Weakness (Soft)
Finger to Nose Test
Pupils

• Check for anisocoria (unequal pupillary size)
• The pupil will be larger on the side of decreased brain activation
• Brain dampens PMRF which inhibits rostral IML, thus decreased brain equals excitation of the IML
• Increase IML = increase pupillary size
New brain works to dampen autonemics and thereby regulating them whereas, old brain increases activity of IML and is usually detrimental over the long course.

Joint receptors, muscle spindles, golgi tendon organs
Orthostatic Intolerance / VSR

• What is it? Forward Head Posture

• How is it measured? Blood Pressure / Sit to Stand app

• What can we do? Restore the sagittal plane dynamics
Orthostasis

Figure 39.1 Influence of gravity on intravascular fluid shift.
Orthostatic Intolerance
Blood Pressure

• higher on the side of PMRF dysfunction

• due to sympathetics not being inhibited as well on that side

• sympathetics incr blood pressure

• essential hypertension can be resultant from decr PMRF function
Heart Rate

- Tachycardia if **RIGHT** PMRF stimulation has decreased
- Arrhythmia if **LEFT** PMRF stimulation had decreased
- How do you measure heart rate?
- What is the clinical presentation?
Hemisphericity

• Side of decreased brain function (imbalance / lobe)
• All stimulation activates the IML
• 10% of brain activates IML
• Mesencephalon activates IML
• The SNS has to stay very close to threshold so that it can be activated very quickly. ie - highway entrance 0-70 or 50-70??
• It is the side of brain that dictates the proper regulation of IML activation. Your ability to activate the correct side of the brain, so that THEY can inhibit their IML properly.
Time to go play!!!! Thank you!!!

Life is motion and who you are in life is in part determined by your motion!

Remove subluxation, restore health, realize potential!

Live, Love, and Lavish!

Be Well!

www.neuroLIFEinstitute.com
www.OTZhealthed.com
Michael.Hall@Life.edu

www.icpa4kids.com
www.ccedseminars.com
Mhall@Parker.edu