POST CONCUSSION SYNDROME

The Role of the Upper Cervical Chiropractor and Collaborative Care

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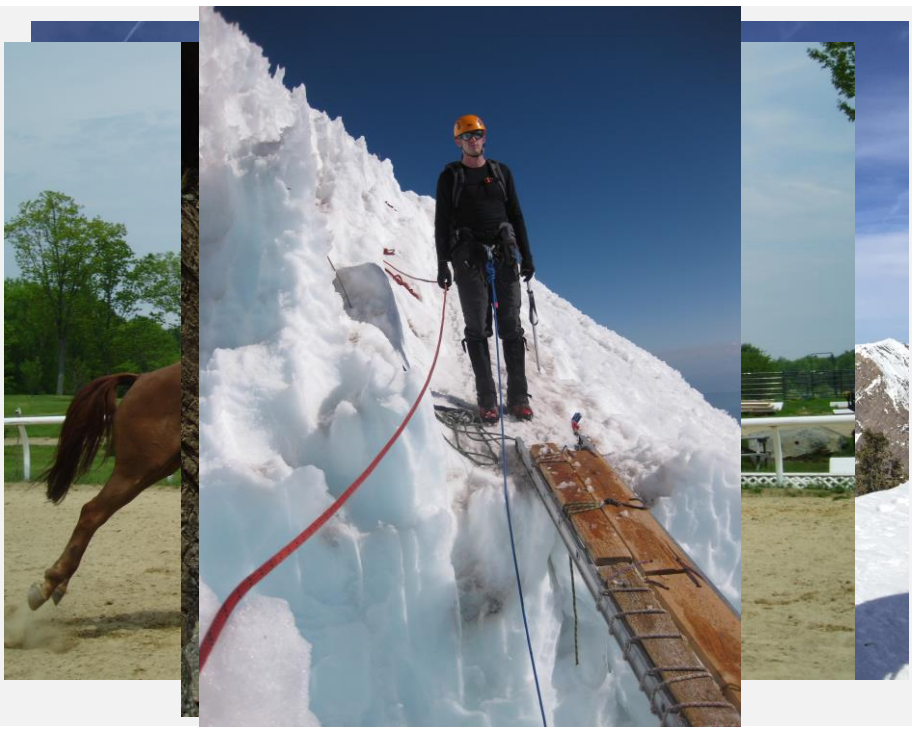
Prepared for Blair Chiropractic Society Annual Conference
10.12.18

WHAT DO YOU WANT TO LEARN?

ARETÉ CHIROPRACTIC

Living life with excellence through fulfillment of purpose and function

- 2005 University of New Hampshire
- 2010 Life Chiropractic College West
  - Dr. Tom Forest
  - Commitment to Excellence LCCW 2009, ACA Scholarship 2009, WCCS Leadership Award 2008
- 2015 ICA-Diplomate in Chiropractic Craniocervical Junction Procedures
- 2010-2015 Lenarz Assoc. Seattle WA
- Blair Primary Certification
- Craniocervical Chiropractic Procedures: a precis of upper cervical chiropractic, JCCA 2015 Jun;59(2):173-92
- Private Practice Portsmouth NH
- Board member ICA-Council on Upper Cervical Care
- 2017, 2018 Wentworth Douglas Hospital Concussion Symposium
- 2018 UMASS Concussion symposium
- NO DISCLOSURES



WE CONTINUE WITH THE HEAD CRACKING ACTIVITIES …

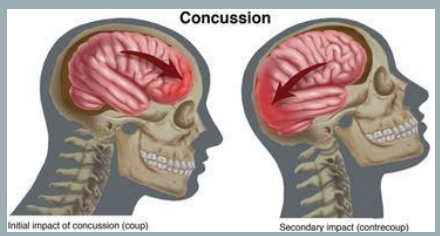
- Defining Concussion/ mTBI
  - Structural Insult
  - Neurophysiologic cascade
- Co-management with Para-professionals
  - They vs. US
  - Who's doing what and speaking the language!
- Role of the Upper Cervical Chiropractor
  - A case study

YOU SEE THESE CASES EVERYDAY

ARE CONCUSSIONS HAPPENING MORE OR ARE WE PAYING MORE ATTENTION?

- Concussion is a form of mild traumatic brain injury that affects an estimated 3.8 million people per year in the United States[1]
  - Langlois JA, Rutland-Brown W, Wald MM. The epidemiology and impact of traumatic brain injury: a brief overview. J Head Trauma Rehabil. 2006;21: 375-8
- While chiropractors have generally not been associated with the care of patients with post-concussion complaints, a cohort study showed that patients with mild traumatic brain injury after motor vehicle crashes commonly utilize chiropractic care[3]
  - Hartvigsen J, Boyle E, Cassidy JD, Carroll LJ. Mild traumatic brain injury after motor vehicle collisions: what are the symptoms and who treats them? A population-based 1-year inception cohort study. Arch Phys Med Rehabil. 2014 Mar; 95(3 Suppl):S286-94.

SYMPTOMS OF A CONCUSSION/ PCS AND OF A WHIPLASH INJURY **OVERLAP**



- Headache
- Dizziness
- Nausea/vomiting
- Irritability, Anxiety
- Vertigo
- Neck Pain
- Back Pain
- Loss of Balance
- Cognitive Impairment
- Trouble sleeping
- Light and Sound sensitivity
- Visual disturbances

This leads to two important points

1. Many people automatically associate concussion with sports however many concussions are suffered from motor vehicle accidents, slips and falls, work injuries, and assaults. Pediatric population is particularly susceptible

2. Chiropractors are likely to see people with persistent post concussion syndrome due to overlapping cervical injury and unresolved symptoms. Vital for the clinician to recognize the management considerations for the head injured patient

CONCUSSION DEFINED

- A Type of traumatic brain injury that changes the way the brain FUNTIONS
- Concussion produces metabolic rather than anatomic injury to the brain
- Can be caused by direct contact to the head but also whiplash type or blast injury
  - The head does not have to be directly hit
  - Loss of consciousness does NOT dictate severity, or diagnosis

CONCUSSION DEFINED

- Research suggests that repeated injury, particularly during the recovery period may result in more severe injury (Second Impact Syndrome)
- Acceleration/ deceleration forces transmitted to the brain immediately after impact
- Causing the cascade of neurochemical events WRT the brain and the acceleration deceleration injury affects the structures of the cervical spine

STRUCTURES THAT ALSO RESPOND TO MECHANICAL STIMULATION AND ARE "CONCUSS-ABLE"

- Olfactory Nerves/ tract
- Retina, optic nerves
- Trigeminal Nerve
- Vestibular Apparatus- semicircular cannals
- Auditory apparatus- cochlea
- Cervical spine soft tissue
  - Muscles, ligaments, tendons, joint capsules, blood vessles
- Cervical spinal cord nuclei- C1-C3 nerve roots
  - From Robert Cantu MD, CTE 2nd Annual Conference BU 11/917

CONCUSSION DIAGNOSIS

- Clinical observations –HX, Physical Exam, Balance Assessment
- Glasgow Coma Scale – physical assessment of Eyes, Verbal, Motor, Score below 14 (DX Acute Concussion)
- The **Brain Trauma Indicator** measures blood plasma levels of the UCH-L1, a protein scientists believe helps dispose of cellular waste in the brain, and GFAP, a structural protein found in non-neuronal cells called astrocytes. Both are released at elevated levels following a concussion or other injury that damages nerve fibers and both can be detected within 20 minutes of a head injury
    - As of Feb 2018 – controversial, pushed through FDA in 6 months lab in San Diego
- Computerized Neurocognitive tests – (ImPACT) – pre/post
- Imaging- CT, MRI, Functional MRI (areas of altered cerebral perfussion)

POST CONCUSSION SYNDROME (PCS)

- Most sports related concussion will self resolve in 7-14 days [1]
- Athletes approximately 10% of patients have symptoms that persist beyond 10 days WRT sports related concussion. [2]
- Non-athletes have shown up to 33% having symptoms beyond 3 months (why is this? – deconditioned cervical spine, less compliance in the brain tissue WRT altered blood/CSF flow?)
- Patients with persistent symptoms 30 days after head injury are diagnosed as PCS

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport – the 5th international conference on concussion in sport held in Berlin, October 2016. Br J Sports Med. Published Online First: 26 April 2017. Doi: 10.1136/bjsports-2017-097699.
2. Leddy JJ, Sandhu H, Sodhi V, et al. Rehabilitation of concussion and post-concussion syndrome. Orthopaedic Surgery. 2012

EVOLVING TREATMENT

- Vienna 2001
  - Completely asymptomatic and normal neuro and cognitive evals before start of rehab program
- Prague 2004
- Zurich 2008
- Zurich 2012
  - Acute rest phase 24-48 hrs. then gradual return to low level activities
- Berlin 2016
  - Acute rest phase 24-48 hrs. then encouraged to become gradually and progressively more active while staying below their cognitive and physical symptoms. Avoid vigorous exertion. **Will benefit from multi-disciplinary approach including cervical rehabilitation, vestibular rehabilitation, and cognitive behavior therapy**[1]

EBP! Could this be that elusive "support in the literature?"

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus statement on concussion in sport – the 5th international conference on concussion in sport held in Berlin, October 2016. Br J Sports Med. Published Online First: 26 April 2017. Doi: 10.1136/bjsports-2017-097699.

We'll get into the "Cerv Rehab" in a minute…

DEVELOPING ACTIVE TREATMENT PLAN

- Buffalo Concussion Treadmill Test – John J Leddy Univ. Buffalo NY
- ≥ 3 points from baseline on a symptom (HA, Dizziness ect)
- Exhaustion
- Reaching age adjusted Target HR
  - 80% of Max HR (220-age)
- Some studies have shown strict rest beyond 2-3 days unsupported by evidence and may prolong recovery from head injury [1,2]

1. Silverberg ND, Iverson GL. Is rest after concussion "the best medicine?": recommendations for activity resumption following concussion in athletes, civilians, and military service members. J Head Trauma Rehabil. 2013 Jul-Aug;28(4):250-259.
2. Grool AM, Agilpay M, Momoli F, et al. Association between early participation in physical activity following acute concussion and persistent post-concussive symptoms in children and adolescents. JAMA. 2016;316(23):2504-2514

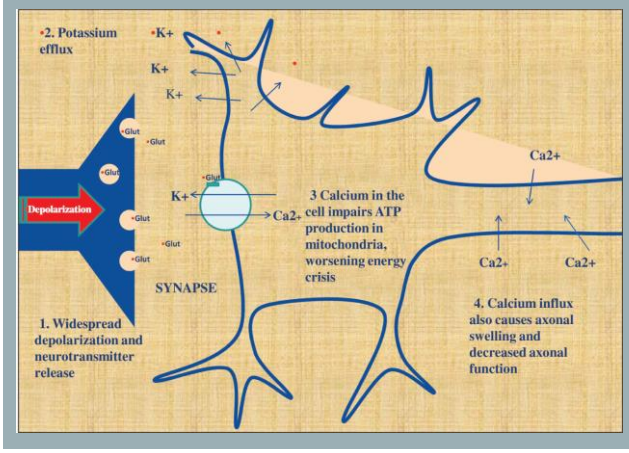
POST CONCUSSION SYNDROME

3 CATEGORIES

Remember we want to know WHO's doing what so we can co-management and communicate effectively!

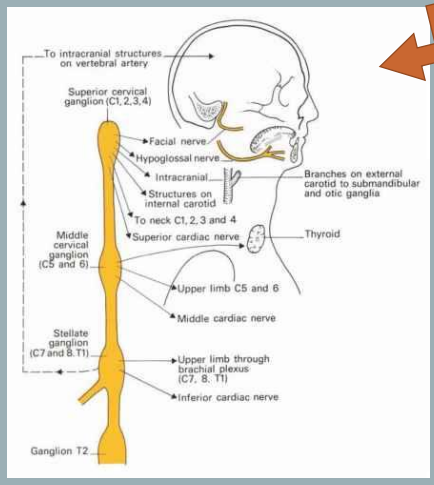
- Physiologic PSC
- Vestibulo-ocular PCS
- Cervicogenic PCS

PHYSIOLOGIC PCS



- Sudden stretching of neuronal and axon membranes
- Widespread depolarization and neurotransmitter release (Glutamate)
- Potassium (K^+) released in neurosynaptic junction
- Calcium (Ca^{2+}) impairs ATP production in mitochondria – energy crisis for the brain, also swelling the axon decreasing functionality

PHYSIOLOGIC PSC

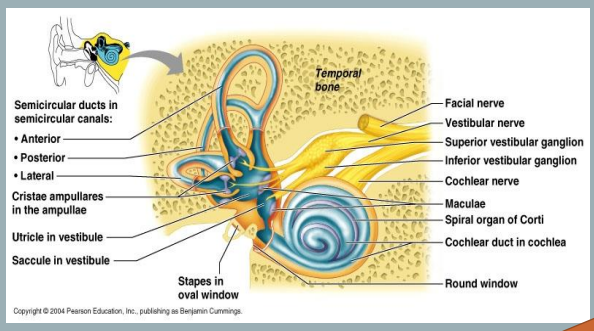


Concuss-able Structures

- Primary issues are energy shortage as the brain NEEDS more ATP for repair the mitochondria are unable to produce it!
- Altered Autonomic functioning: Sympathetic overdrive
  - ↑ HR, ↑Pupil Dialation, ↓ Digestion, ↑ Saliva
- This challenges cerebral auto regulation (maintenance of constant cerebral blood flow despite changes in cerebral perfusion pressure)

- Ellis MJ, Leddy JJ, Wiler B. Physiological, vestibulo-ocular, and cervicogenic post-concussion disorders: an evidence-based classification system with directions for treatment. Brain Inj. 2015;29(2):238-248.

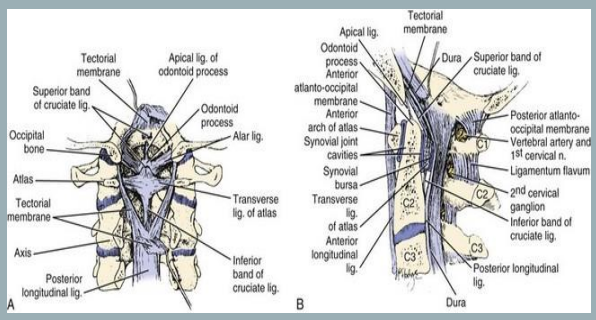
VESTIBULO OCCULAR PCS



Dr. Amy's going to drop some knowlege

- Already discussed how the retina, semi circular canals, optic nerve, cochlea are "concussable"
- Benign Paroxysmal Positional Vertigo (BPPV) testing
  - 28% of patients with head trauma have BPPV
  - Dix Hallpike/ Epply Posterior canal (tilt) Anterior canal (yes) Roll test for Lateral/horizontal canal (no)
- Vestibular Occular Motor Screening (VOMS)
  - Smooth pursuit, Saccades (Hor/Vert), Near Pt Convergence, VOR (Hor/Vert)

CERVICOGENIC PCS



- Studies measuring force profiles for concussion show a range of between 60-160g. Mild strain of the cervical spine can occur in the 4.5 g range[1]
- Patients with cervical spine injury AND concussion 4x more likely to have persistent sx than those with concussion and no cervical injury[2]

Could this be extrapolated as "Evidence" for preventative care?

1. Marshall CM, Vernon H, Leddy JJ, and Baldwin BA. The role of the cervical spine in post-concussion syndrome. Phys Sportsmed, 2015 Jul;43(3):274-284.
2. 11 Ellis MJ, McDonald PJ, Olson A et al. Cervical spine dysfunction following pediatric sports-related head trauma. J Head Trauma Rehabil. 2018 Jul 24. doi: 10.1097/HTR.0000000000000411

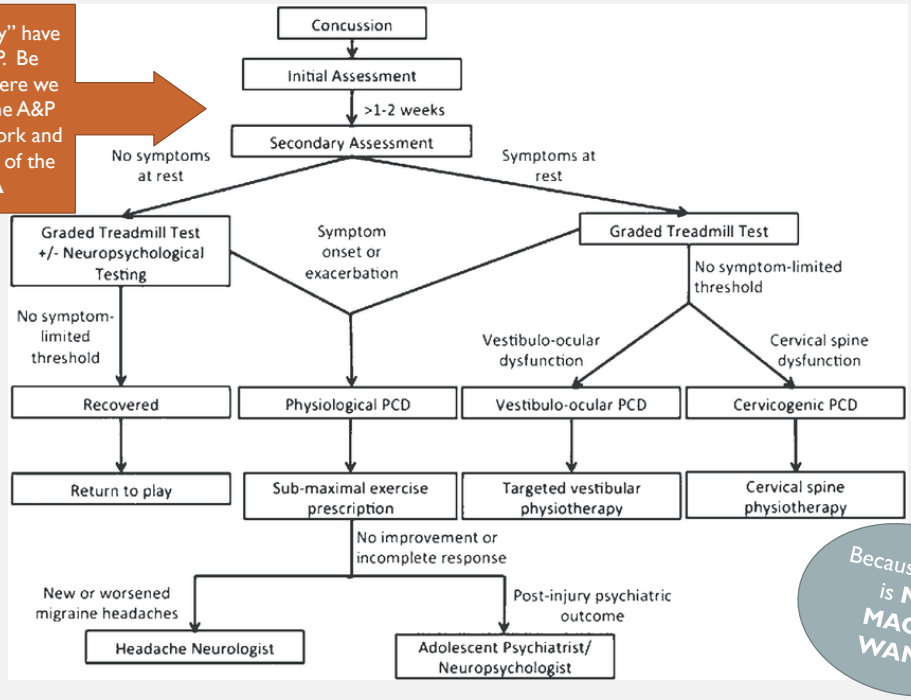
CERVICOGENIC PSC CONT

- Headaches after a head/neck injury are so common many post-traumatic headaches classified as cervicogenic headache in the literature[1]
- Recent PT clinical trials for cervicogenic headache show promise with HVLA, Sustained natural apophyseal glide (SNAG), and upper cervical manual mobilization [2,3,4]

There's your sign

1. Bogduk N, Govind J. Cervicogenic headache: an assessment of the evidence on clinical diagnosis, invasive tests, and treatment. Lancet Neurol. 2009 Oct;8(10):959-968.
2. Dunning JR, Butts R, Mourad F, et al. Upper cervical and upper thoracic manipulation versus mobilization and exercise in patients with cervicogenic headache: a multi-center randomized clinical trial. BMC Musculoskelet Disord. 2016 Feb 6; 17:64.
3. Hall T, Chan HT, Christensen L, et al. Efficacy of a C1-C2 self-sustained natural apophyseal glide (SNAG) in the management of cervicogenic headache. J Orthop Sports Phys Ther. 2007 Mar; 37(3): 100-107.
4. Malo-Urres M, Tricas-Moreno JM, Estebanez-de-Miguel E, et al. Immediate effects of upper cervical transatoric mobilization on cervical mobility and pressure pain threshold in patients with cervicogenic headache: a randomized controlled trial. J Manipulative Physiol Ther. 2017 Nov-Dec;40(9): 649-658.

This is what "They" have created for EBP. Be excited about where we can play. Know the A&P to support our work and never loose sight of the **BIG IDEA**



Because there is **NO MAGIC WAND**

ROLE OF THE UPPER CERVICAL CHIROPRACTOR

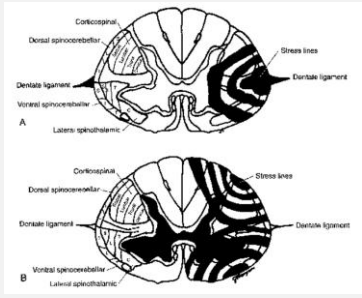
- **Sensorimotor Integration**
  - How our body sensory system alters out motor patterns
- **Proprioception**
  - Joint position sense and the sense of a limb movement with absence from visual cues. Muscle spindles
- **Somatosensory Gating**
  - The ability to inhibit sensory information to avoid undesirable reactions
- **Centrally modulated pain**
  - CNS using peripheral signals to maintain it's internal frame of reference
- **Feed Forward Activation**
  - CNS will activate variety of postural muscles prior to any movement of limbs

HERO.

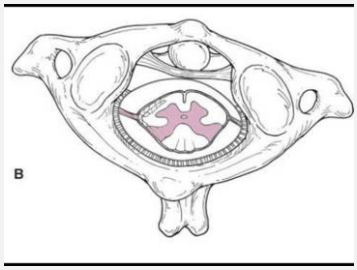
1. Exploring the Neuromodulary Effect of the Vertebral Subluxation Complex and Chiropractic Care. Haavik-Taylor H. et al. Chiro J of Austrailia 2010 (Mar);40(1):37-44

THE ROLE OF THE UPPER CERVICAL CHIROPRACTOR

- "-The results strongly favour the theory that CSM is caused by tensile stresses transmitted to the spinal cord from the dura via the dentate ligaments. A spondylotic bar can increase dentate tension by displacing the spinal cord dorsally, while the dural attachments of the dentate, anchored by the dural root sleeves and dural ligaments, are displaced less."[1]



Spinal Tracts-
Spinocerebellar
Lateral Corticospinal
(**Pelvic Balance**)



1. Pathogenesis of Cervical Spondylotic Myelopathy Levine D. J of Neurology Neurosurgery and Psychiatry 1997;62:334-340

THE ROLE OF THE UPPER CERVICAL CHIROPRACTOR

- Due to the unique mobility of the CCJ forces strong enough to create concussion affect the mechanical structures [1,2]
  - Cranial/cervical muscles, ligaments, facets, nerves, discs, vascular structures
  - C1-3 afferents projecting the Trigemino-cervical nucleaus in the brainstem- nocioception for the head and neck
- High density of mechanoreceptive afferents projecting to the vestibular structures of the CNS including vestibular nuclei and cerebellum [3]
  - These afferents mediate head and neck position sense through reflexes like cervicocollic reflex, vestibulocollic reflex, tonic neck reflex, cervico-ocular reflex. These reflexes help the brain integrate visual, vestibular and proprioceptive information to help you know where your head is in space.
- When the reflexes are in conflict (ex: altered information from the visual pathways compared to the cervical proprioceptors) you get dizziness/ vertigo!

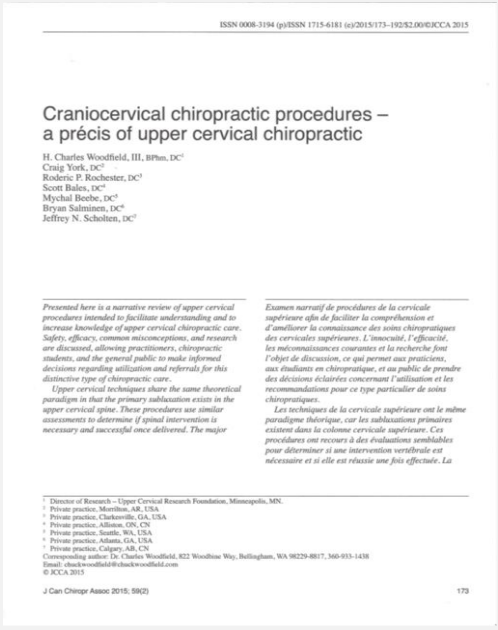
1. Freeman M., Rosa S., Harshfield D., et al. Journal Brain Injury, July 2010; 24(7-8):988-994
2. The Craniocervical Junction: Observations regarding the Relationship between Misalignment, Obstruction of Cerebrospinal Fluid Flow, Cerebellar Tonsillar Ectopia, and Image-Guided Correction. Rosa S., Baird J., Smith FW, Dworkin SJ (eds): The Craniocervical Syndrome and MRI. Basel, Karger 2015, pp 48-66
3. Ellis MJ, Leddy JJ, Wiler B. Physiological, vestibulo-ocular, and cervicogenic post-concussion disorders: an evidence-based classification system with directions for treatment. Brain Inj. 2015;29(2):238-248

ROLE OF THE UPPER CERVICAL CHIROPRACTOR

- WHAT ABOUT THE PHYSIOLOGIC PSC?
- "To prevent damage to the brain from excess pulsatility pressure, the increase in volume must be matched by a simultaneous increase in drainage of venous blood and CSF from the cranial vault." [1]
- "In brief the CCJ in a potential choke point for blood and SCF flow between cranial vault and spinal canal that can cause faulty craniospinal hydrodynamics and subsequent chronic ischemia, edema, and hydrocephalus."[1]
- After trauma there is metabolic dysfunction in brain tissue as well as an increase in neuroinflammatory cytokines and chemokines[2]

Exciting new research around CSF Flow and CCJ allignment

1.The Role of the Craniocervical Junction in Craniospinal Hydrodynamcs and Neurodegenerative Conditions Flanagan M. Neurology Research International, Hindawi Publishing Corp.Vol. 2015 Article ID 794829
2. Concussion Update: Immunoexcitotoxicity, and Common Etiology of Postconcussion Syndrome, Chronic Traumatic Encephalopathy and Posttraumatic Stress Disorder. Marron J. et al. Smith FW, Dworkin SJ (eds): The Craniocervical Syndrome and MRI. Basel, Karger 2015, pp 22-32



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Craniocervical chiropractic procedures – a précis of upper cervical chiropractic

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Mychal Beebe, DC[5]
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Jeffrey N. Scholten, DC[7]

Presented here is a narrative review of upper cervical procedures intended to facilitate understanding and to increase knowledge of upper cervical chiropractic care. Safety, efficacy, common misconceptions, and research are discussed, allowing practitioners, chiropractic students, and the general public to make informed decisions regarding utilization and referrals for this distinctive type of chiropractic care.

Upper cervical techniques share the same theoretical paradigm in that the primary subluxation exists in the upper cervical spine. These procedures use similar assessments to determine if spinal intervention is necessary and successful once delivered. The major

Examen narratif de procédures de la cervicale supérieure afin de faciliter la compréhension et d'améliorer la connaissance des soins chiropratiques des cervicales supérieures. L'innocuité, l'efficacité, les méconnaissances courantes et la recherche font l'objet de discussion, ce qui permet aux praticiens, aux étudiants en chiropratique, et au public de prendre des décisions éclairées concernant l'utilisation et les recommandations pour ce type particulier de soins chiropratiques.

Les techniques de la cervicale supérieure ont le même paradigme théorique, car les subluxations primaires existent dans la colonne cervicale supérieure. Ces procédures ont recours à des évaluations semblables pour déterminer si une intervention vertébrale est nécessaire et si elle est réussie une fois effectuée. La

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[2] Private practice, Morrilton, AR, USA
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Corresponding author: Dr. Charles Woodfield, 822 Woodbine Way, Bellingham, WA 98229-8817, 360-933-1438
Email: chuckwoodfield@chuckwoodfield.com

One of the only multi technique overviews of Upper Cervical indexed in PubMed.

45,200 Chiropractors practicing in the U.S. – Dept. of Labor
(http://www.bls.gov/ooh/healthcare/chiropractors.htm)

NBCE reports 1.7% of practitioners use Upper Cervical. Approx = 768.4

CRANIOCERVICAL CHIROPRACTIC PROCEDURES- A PRECIS OF UPPER CERVICAL CARE. (WOODFIELD C. ET. AL. J OF CAN CHIROPR ASSOC. 2015; (59)2

Upper Cerivcal Tecnique	Knee Chest	Blair	Grostic	Nucca	Orthospinology	AO/AdvO
Palpation	X	X	X	X	X	X
Function LLI		Prone	Supine	Supine	Supine	Supine
Thermography		X	X	X	X	X
Posture	X			X	X	
Radiography		X	Pre/Post	Pre/Post	Pre/Post	Pre/Post

Important article when reaching out to para professionals and they Ask "what is Upper Cervical"

Commonalities in Imaging

Covers common conditions and symptoms UC has reported on

SYMPTOMATIC REACTIONS, CLINICAL OUTCOMES AND PATIENT SATISFACTION ASSOCIATED WITH UPPER CERVICAL CHIROPRACTIC CARE: A PROSPECTIVE MULTICENTER, COHORT STUDY

(ERICKSEN K, ROCHESTER R, HURWITZ E. BIOMEDCENT MUSCULOSKELETAL DISORDERS 2011, 12:219)

- **83 Chiropractors** – "all doctors agreed to refrain from using any other type of spinal care (ie: full spine manipulation, physical therapy, massage therapy) other than the upper cervical technique that they were trained to use."
- **Outcome Measures-** Neck Pain Disability Index, Oswestry Back Pain Disability Index, 11 pt Numerical Rating Scale, Patient treatment Satisfaction and Symptomatic Reaction (SR = new complaint or worsening of present complaint by >30% on 11NRS. w/in 24 hours of office visit)
- N= 1090
- Avg # Office Visits: 4.5 over 17 days
- Avg # Adjustments: 2.4

SYMPTOMATIC REACTIONS, CLINICAL OUTCOMES AND PATIENT SATISFACTION ASSOCIATED WITH UPPER CERVICAL CHIROPRACTIC CARE: A PROSPECTIVE MULTICENTER, COHORT STUDY

(ERICKSEN K, ROCHESTER R, HURWITZ E. BIOMEDCENT MUSCULOSKELETAL DISORDERS 2011, 12:219)

- 31% Symptomatic Reaction
- 5.1% Severe Reaction (NRS greater or equal to 8)
- Patient Satisfaction 9.1/10 "How satisfied are you with the treatment by your chiropractor?"
- Statistically Significant Improvement in
- Neck Pain
- Headache
- Midback Pain
- Low Back Pain
- (Many other non-MSK symptoms reported in this study- above were most prevalent)

SYMPTOMATIC REACTIONS, CLINICAL OUTCOMES AND PATIENT SATISFACTION ASSOCIATED WITH UPPER CERVICAL CHIROPRACTIC CARE: A PROSPECTIVE MULTICENTER, COHORT STUDY

(ERICKSEN K, ROCHESTER R, HURWITZ E. BIOMEDCENT MUSCULOSKELETAL DISORDERS 2011, 12:219)

- ICA Best Practices
- **Lower Back Pain** N=4,661
- 8.3 OV (adj. each visit)
- 42.6% improvement based on NRS

- **Neck Pain** N= 2,069
- 7.7 OV
- 46.5% improvement based on NRS

- UCT Improvements based on 11pt-NRS

- Headache: 62.8%

- Neck Pain: 56.8%

- Mid Back Pain: 58.6%

- Low Back Pain: 57%

"A direct comparison can not be made due to differing patient populations and other reasons. It can be said that UCT fairs well when judged against the published guidelines and other studies in terms of patient safety and clinical Efficacy."

CASE STUDY

20 year old Female patient began care 5/2017.

Concussion December 2016

MVA 5 2017 20mph Rear ended

She was experiencing daily chronic moderate to severe headaches, Skull base pain, Neck pain, Cognitive difficulty,Visual disturbances and Nausea.

CO-managed with Naturopathic Doctor

Neuro-Optometry

Biofeedback

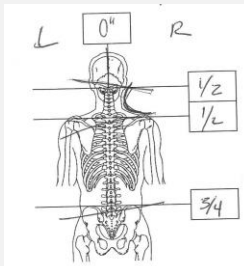
- First adjustment day MVA!

	Cerv	Pain	Lumb	Pain	
Flex	60	+	90	-	
Ext	70	+	30	+	Nausea
R Lat Flex	75	-	35	+	
L Lat Flex	65	+	35	sl	
R Rot	60	+	20	+	
L Rot	80	+	30	-	

Muscle spasm: Sup Obl L, Inf Obl R, SCM R, Lev R
+Foramina Comp Bi
+Jackson Comp Right
+Shoulder Depression Right
+Spurling Test Right

+ Convergence Insufficiency @ 16”
+VOR Vert (dizziness, nausea)
+ CN XI Left

WHICH CATEGORY OF PCS?



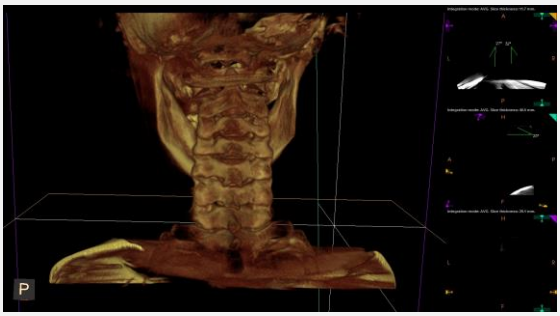
Forward Head Posture 2.23 in

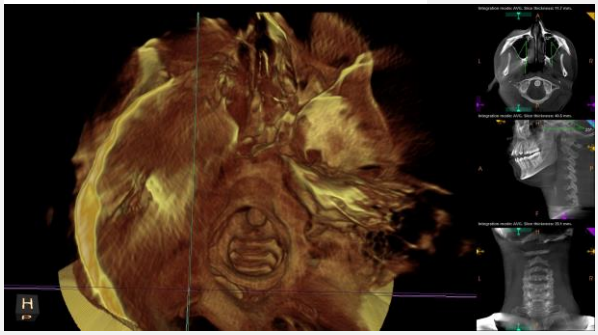
d Weight 8 lb Effective Strain 25

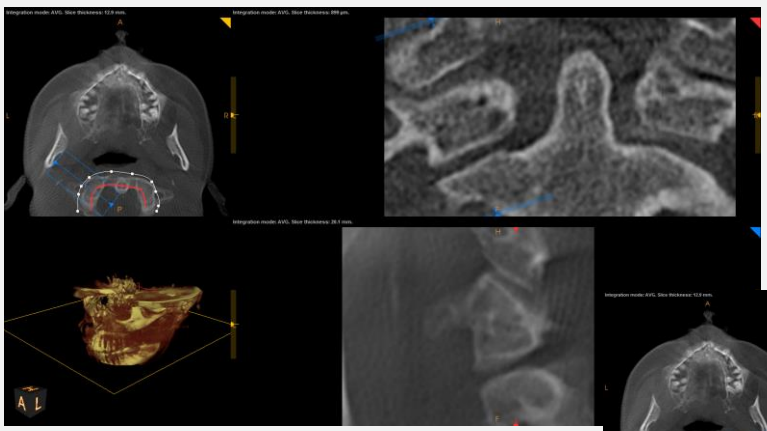
RAND 36-Item Health Survey

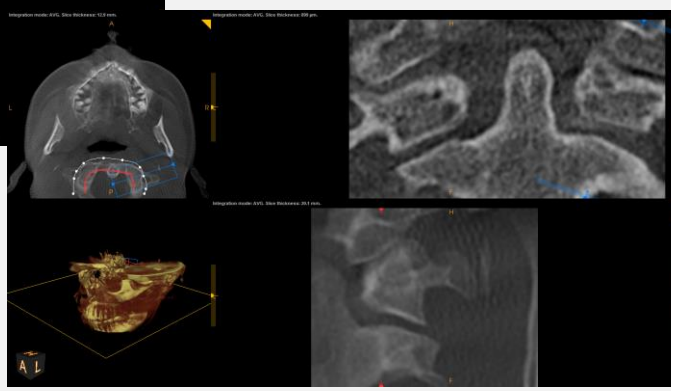
Physical Functioning	80	Emotional Well-Being	72
Role Limitations Due to Physical Health	50	Social Functioning	75
Role Limitations Due to Emotional Problems	100	Pain	77.5
Energy/Fatigue	25	General Health	75
Overall Score	69.31		

Developed as part of the Medical Outcomes Study, the RAND 36-Item Health Survey is a widely-utilized scoring system for patient self-reported quality of life measures. Each section is scored on a 0-100 scale, with 100 being optimal. The Overall Score is an average of the eight sections.





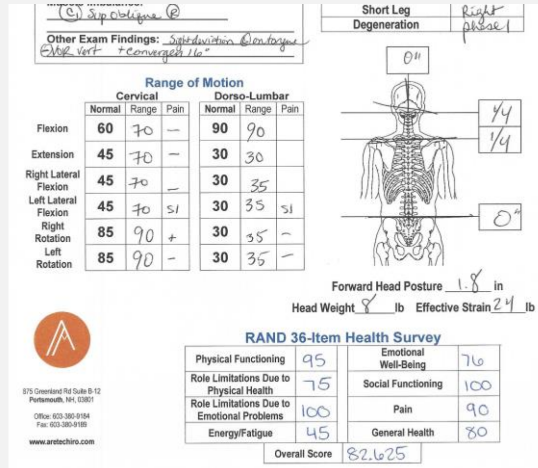




18 VISITS FROM 5/17-4/18
8 BLAIR CORRECTIONS

Reporting only slight mild occasional headache.

WITH CO-MANAGEMENT



(C1) Sup oblique (R)

Other Exam Findings: Slight deviation (L) on tongue (-)VOR vert +convergence 16°

Short Leg	Right
Degeneration	phase 1

Range of Motion

	Cervical			Dorso-Lumbar		
	Normal	Range	Pain	Normal	Range	Pain
Flexion	60	70	-	90	90	
Extension	45	70	-	30	30	
Right Lateral Flexion	45	70	-	30	35	
Left Lateral Flexion	45	70	SI	30	35	SI
Right Rotation	85	90	+	30	35	-
Left Rotation	85	90	-	30	35	-

0"
1/4
1/4
0"

Forward Head Posture 1.8 in
Head Weight 8 lb Effective Strain 24 lb

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RAND 36-Item Health Survey

Physical Functioning	95	Emotional Well-Being	76
Role Limitations Due to Physical Health	75	Social Functioning	100
Role Limitations Due to Emotional Problems	100	Pain	90
Energy/Fatigue	45	General Health	80
Overall Score	82.625		

All orthopedic exams normal

WHAT DID YOU GET OUT OF THIS?

DO YOU WANT TO KEEP YOUR JOB?

International Chiropractic Association

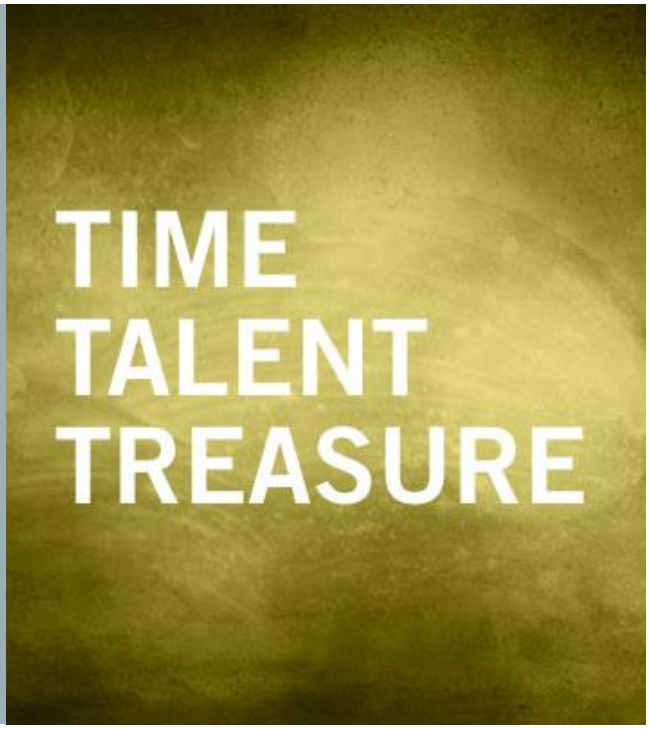
Council on Upper Cervical Care

Blair Society

State Organization

Haavik Research- The Reality Check

$$ The Subaru and the Scion $$



The quality of your life is dictated by the questions that you ask

ICA COUNCIL ON UPPER CERVICAL CARE

NEXT CLASS STARTING SPRING 2019

IN REVIEW…

- **Overview of Concussion and PCS**
  - YOU ARE SEEING THESE CASES!
- **Feel supported by the literature**
  - WHO's been to a paraprofessional conference?
  - They vs. Us: ½ of the energy!
- **Co-management begins with certainty in what you do and knowing what others do. Speaking the language**

THANK YOU

associate spring summer 2019

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