Proceedings of the 3rd Sacro Occipital Technique Research Conference

Nashville, Tennessee

May 19, 2011

Sacro Occipital Technique Research Conference

Nashville, Tennessee
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CONFERENCE PROCEEDINGS

Conference Chair
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Introduction

For Major Bertrand DeJarnette, DO, DC, research was an essential part of being a chiropractor and essential to the future of the chiropractic profession. As early as July 1935 Major Bertrand DeJarnette was a featured speaker at the 40th Anniversary Convention 1895-1935 of the National Chiropractic Association presenting clinical research. Always research was his passion and in an interview in 1982 DeJarnette reiterated, "as far back as chiropractic college, I saw the need for a more scientific basis for chiropractic theory. My own personal physical problems had not been solved by medicine, osteopathy, or chiropractic; so I began experimenting on myself. I'm still at it, and I can see no end of the need for continuous research in chiropractic [1]."

Dr. DeJarnette saw the importance of sharing clinical experience through case report and self-analysis. This started as he first began to find that things he instinctively did for a patient would disappear from his memory if he did not outline them carefully. So before our day and age of computers, he recommended that to begin the first step in research, you would need to buy a notebook, an eraser and long pencil. He emphasized that, "those would be your first three pieces of research equipment. You use your notebook because it is not expensive. You use a pencil because it can be erased, and of course mistakes will be made so you must own an eraser [2]." With those three pieces of equipment he sat down one evening and wrote his first case report of an unusual patient presentation and his treatment rendered. He recollected that he did not sit down to write until perhaps three months after that patient's presentation. Dr. DeJarnette could not believe how much he had forgotten about the details. The lesson he learned was "write the unusual down now [2]".

When Dr. DeJarnette began to study the treatment he had rendered he realized that if any meaningful information were to evolve from his experience, he would have to resolve it himself. Dr. DeJarnette suggested that research has to be a free agency. Basically he saw a need and worked to fulfill that need. He realized that explaining how his discoveries evolved was more difficult than the process of developing new diagnostic and therapeutic interventions [2].

Chiropractic techniques, innovative integrative collaborations, and methods such as sacro occipital technique, temporomandibular disorder co-management, chiropractic manipulative reflex technique, and cranial techniques need an arena to share clinical and other forms of research. Critical study of techniques and innovative methods are what will help propel healthcare forward in this era of evidence informed practice and best practice research.

The SOT Research Conference looks to offer a venue for research papers; specifically those, which investigate sacro occipital technique, dental chiropractic co-treatment, cranial techniques, viscerosomatic/somatovisceral, reflex techniques, and new ground-breaking creative ways of helping humanity without necessarily the use of drugs or surgical intervention. This year's proceedings of the second annual SOT research conference will be shared with the chiropractic profession, for review, dissemination, and in-depth study.

> *"Research is a study of what you have, and what you need to make it better, and how to make it better is the final research step. S.O.T. never wants to be just good. It always wants to be better and best and greatest and most dependable* [3]*."*

As a parting comment for his chiropractic colleagues Dr. DeJarnette said, "We must respect each other's beliefs. We must support our colleges and associations. We must work together and unite as a profession. And we must at all times be proud of chiropractic and proud of our calling as chiropractors [1]."

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1. DeJarnette MB. **Cornerstone**. *The American Chiropractor*. Jul/Aug 1982; 82: 22,23,28,34.

2. DeJarnette MB. **The Sacro Occipital Technique Bulletin**. Mar 1975.

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Evidence-Based Practice

Evidence-based practice (EBP) refers to a decision-making process which integrates the best available research, clinician expertise, and client characteristics. EBP is an approach to treatment rather than a specific treatment.

Evidence-based practice (EBP) involves complex and conscientious decision-making which is based not only on the available evidence but also on patient characteristics, situations, and preferences. It recognizes that care is individualized and ever changing and involves uncertainties and probabilities [1].

EBP develops individualized guidelines of best practices to inform the improvement of whatever professional task is at hand. Evidence-based practice is a philosophical approach that is in opposition to rules of thumb, folklore, and tradition. Examples of a reliance on "the way it was always done" can be found in almost every profession, even when those practices are contradicted by new and better information [1].

> "*It's about integrating individual clinical expertise and the best external evidence* [2]."

However, in spite of the enthusiasm for EBP evinced over the last decade or two, some authors have redefined EBP in ways that add other factors to, the original emphasis on empirical research foundations. For example, EBP may be defined as treatment choices based not only on outcome research but also on practice wisdom (the experience of the clinician) and on family values (the preferences and assumptions of a client and his or her family or subculture) [1].

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1. Buysse V, Wesley PW. **Evidence-based practice: How did it emerge and what does it really mean for the early childhood field?** *Zero to Three*. 2006;27(2), 50-55.

2. Sackett DL, Rosenberg WMC, Muir Gray JA, Haynes RB, Richardson WS. **Evidence based medicine: what it is and what it isn't.** *BMJ.* 1996;312:71-72.

Evidence Based Practice: The Hierarchy of Evidence:

In biomedical science there is general agreement over an evidence based hierarchy: the higher up a methodology is ranked, the more robust and closer to objective truth it is assumed to be. The orthodox hierarchy looks something like the following table:

Rank:	Methodology	Description
1	Systematic reviews and meta-analyses	Systematic review: review of a body of data that uses explicit methods to locate primary studies, and explicit criteria to assess their quality. Meta-analysis: A statistical analysis that combines or integrates the results of several independent clinical trials considered by the analyst to be "combinable" usually to the level of re-analyzing the original data, also sometimes called: pooling, quantitative synthesis.
2	Randomized controlled trials	Individuals are randomly allocated to a control group and a group who receive a specific intervention. Otherwise the two groups are identical for any significant variables. They are followed up for specific end points.
3	Cohort studies	Groups of people are selected on the basis of their exposure to a particular agent and followed up for specific outcomes.
4	Case-control studies	"Cases" with the condition are matched with "controls" without, and a retrospective analysis used to look for differences between the two groups.
5	Cross sectional surveys	Survey or interview of a sample of the population of interest at one point in time
6	Case reports.	A report based on a single patient or subject; sometimes collected together into a short series
7	Expert opinion	A consensus of experience from the “good and the great.”
8	Anecdotal	An interesting story.

Evidence Informed Practice

The term evidence based medicine (EBM) has traditionally been used to describe a means of treating patients based on research published in biomedical journals. Even though EBM also incorporated expert opinions and a doctor's clinical experience, it was common that insurance companies and other agencies - presumably seeking to protect patients or save money - would focus solely on the randomized controlled trial as the backbone of EBM.

When EBM appeared to be too restrictive or just clearly misinterpreted new terms such as Evidence Based Practice and now Evidence Informed Practice (EIP) have appeared. The value of EIP is that it takes research into account when making a clinical descision but also utilizes patient values and preferences, risk benefit ratio of related or chosen therapy, and the doctor's clinical experience. Because this represents a clearer depiction of an actual clinical experience and at the same time seeks to offer the patient the highest level of care, the belief is that EIP is the best of what EBM has to offer.

It is important that a practitioner is aware of the current research on effectiveness of their care so that they do not inadvertently make false or exagerated claims regarding the potential benefits of the treatment rendered. Therefore keeping up to date on the research and literature, while time consuming, is an ethical obligation of doctors in practice.

Ideally doctors practicing EIP would best be able to predict and provide outcome expectations against which progress could be measured. In essence we all, as patients or doctors, should receive or offer treatment based on research and clinical experience. New research can uncover therapeutic interventions or benefits of certain types of care that were never before discovered. Also this research may determine that prior care that was customarily rendered is now inappropriate.

The challenge with chiropractic and its various techniques is that we are functioning from a situation where we have limited funds and limited methods to adequately study our innovative therapeutic applications. This conference attempts to offer a tempered and reasonable voice for practitioners on the forefront of care, such as has been the case with Sacro Occipital Technique (SOT) for years. Incorporating current research performed in the patient's best interest with one's own clinical experience is the hallmark of a responsible and ethical physician. Allied healthcare practitioners, chiropractors, and particularly SOT doctors have a responsibility to lead the way with EIP and focus first and foremost on patient based care.

Major Bertrand DeJarnette DO, DC developed SOT with outcome based assessment protocols and with research accountability as its backbone. The onus is upon us, those who learn and utilize his methods to be informed of the evidence and evolving research, and utilize this in the clinical application of SOT and its related methods.

The Case Report: How the Doctor in Practice Communicates to the Research Community

While low on the evidence-based practice hierarchy of evidence the case report is an extremely valuable manner for doctors in clinical practice or "in the trenches" to communicate what is taking place in their practices. Until the doctors in clinical practice publish their case reports, researchers in a college setting can only attempt to guess what is taking place out there in the field.

There are significant limitations to case reports, such as no control subjects, the doctor and subjects are not blinded to the study, and the doctor's bias may cloud the study. So while the case report is an important tool for communication, the doctor authoring these studies needs to exercise caution to not over-interpret his or her findings. Dr. Robert Ward of Southern University of Health Sciences and past editor of *The Journal of Chiropractic Education* answers the question:

"Why it is important to write a case report?"

"Most persons believe that the case report is used to describe unique, or at least highly rare, clinical presentations or diagnostic entities (e.g., "prostatic hypertrophy mimicking as ingrown toenail"). This is the most common use of the case report. However, equally important is the use of the case report to describe novel management approaches to more ordinary conditions.

"Another aspect of why case reports are written involves the audience. Case reports are generally considered as a communication from clinicians to scientists. The pointy-headed ivory tower population doesn't get to see the interesting things that happen in clinical practice. They often rely on case reports from the field in deciding what sorts of pilot studies to run, and those often lead to real full-scale clinical trials (the sort of research that field clinicians generally don't have the time, resource or interest to undertake).

"Case reports are a vital aspect of our literature base, and more of our practitioners need to write them. Until you write up that wonderful method that works in your office, the rest of the world cannot share in its benefits. Without publication, when you die or retire, your discoveries die with you [1]."

1. Ward RW. **Why it is Important to Write a Case Report**. *Dural Connection Internet Edition*. 2006;3(3). [http://www.sotousa.com/wp/?page_id=716] Last accessed September 26, 2010.

2011 SOT Research Conference Schedule

May 19, 2011 · Nashville, Tennessee

1:00 – 1:50 PM **Interdisciplinary Care**

Introduction of Ayurveda to Chiropractic, Building a Functional Bridge.
Dov Pine

CMRT and acupuncture in the treatment of dysmenorhea (oligomenorhea): A case report.
Christine D. Benner, DC, LAc

The alterations of the dyspeptic signs and symptoms of patients with gastritis following chiropractic treatment: A small randomized controlled study.
Janaina Butafava, DC, Fábio Dal Bello, DC, MSc

2:00 – 2:50 PM **Applied Clinical Application and Integrative Inquiry**

SOT procedures, case studies, and standard orthopedic testing: A case series.
Harvey Getzoff, DC

SOT: category three: Predictability of outcomes: A case series.
Harvey Getzoff, DC

One cause, one cure, one equation: Enteric structural mechanics and enteric axial harmonics: A case report.
Laura Hopkins, EC, Jim Countryman DC

3:10 – 4:00 PM **Cranial, Vision, and Pediatric Applications**

Vision induced migraine headaches: A case report.
Charles Beck, DO

Vision induced chronic low back pain: A case report.
Charles Beck, DO

Chiropractic care of a two year-old diagnosed with reflux and a hiatal hernia: A case report.
Martin G. Rosen, DC, Charles L. Blum, DC

4:10 – 5:00 PM **Integrative Inquiry and Healthcare**

Dentofacial orthopedics and maxillary morphogenesis: A case series.
Theodore Belfor, DDS

Nighttime biofeedback as a tool for the reduction of habitual bruxism activity and related TMD symptoms.
Lee Weinstein

Cervical traction, TMJ disorders, chiropractic and dental co-treatment: A case report.
Charles L. Blum, DC, Richard C. Gerardo, DC

Vision induced migraine headaches: A case report.
Charles Beck, DO

Introduction:

What direct relationship might the eyes or vision play in the causation of headaches or other symptoms related to physical changes in the fascia (both internally and externally) of the cranium? If the eye muscles, visual reflex centers, or other neurologically related circuitry have a direct relationship to sustained myofascial imbalance, this may be an important part of a clinical differential diagnosis.

A series of case reports involving both spinal and cranial manipulative interventions have discussed a relationship between vision and successful treatment [1-4].

In a case control study, Monaco, et. al. found a positive correlation between ocular correction effects on EMG activity of stomatognathic muscles in children (n=320) with functional mandibular lateral-deviation. This showed a relationship between standard prescriptive ophthalmic evaluations and how they could be improved with a functional assessment tool to evaluate any related myofascial interrelationship [5].

Weiner, et. al., performed the first published case series study (n=6) evaluating the use of cranial manipulative treatment of patients utilizing ocular changes for treatment purposes. They found "significant changes in ocular refraction, corneal curvature, and ocular position noted and measured as a concomitant of the use of dental appliances and/or osteopathic craniosacral manipulations in ongoing therapies for treatment of temporomandibular joint (TMJ) syndrome and other related head, neck, and shoulder problems. The near-immediacy in time of these variations and the absence of other reasonable causes suggest that precise monitoring of these patients before treatment begins and during subsequent therapy can assist the practitioner in quantifying the progress and effects of the treatment of chronic head, neck, and swallowing problems [6]." Their six case histories demonstrated "significant changes in hypereye, proptosis, corneal astigmatism (and axis), and refractive error. The magnitude of these alterations ranges from 25% to 300% of the pretreatment condition [6]." They cautioned that, "while the subjective symptom improvement of these cases would have to be regarded as anecdotal, visual parameter analysis of a large patient population may help to provide predictive cause and effect assumptions [6]."

Therefore the purpose of this study is to determine if a relationship can be found between vision and its affect on the cranium, stomatognathic system and posture, and if this relationship can be used to for both assessment and treatment of patients in an interrelated and interdisciplinary manner.

Case History:

A 53-year-old white female patient presented with a history of migraine-type, intense headaches, "dizziness" and "eyestrain" that began approximately 7 months ago. The

patient stated that “I can read but I cannot see” and that her “eyes cannot focus”. She denied any trauma associated with the onset. Patient denied any traumatic or pathologic visual problems including: amblyopia, anisometropia, diplopia, strabismus, glaucoma, ophthalmoplegia, pterygium, retinitis, or macular degeneration.

The patient had a history of lower back pain that began after a motor vehicle accident in 1983. She said that the eyestrain makes the back pain worse. She had recently gone back to school to study Chinese Medicine and had noticed a significant increase in the symptoms and severity since classes began. The symptoms improved with rest and sleep and worsened with continuous use of her eyes when studying.

Frequent breaks from studying allowed the patient to complete her schoolwork, but interfered with her quality of life and significantly lengthened her study time. She made special arrangements to have extra time for examinations due to the headaches and dizziness brought on by reading. The patient has been to see five different eye doctors prior to her initial visit to the clinic and received and filled six different eyeglass prescriptions in an attempt to alleviate the problem. She had also seen a neurologist who reported no pathology and did not recommend medication or imaging studies. She was referred to the office by her local osteopath for evaluation of visually induced somatic strain. She was wearing corrective lenses with bifocals. She stated that she felt that the clinic is her last hope to be able to continue in school.

Her medical history was remarkable for Hashimoto’s thyroiditis since 1997, thyroidectomy in 1997, a prescription for Synthroid 0.1 mg daily and a blend of 38 Chinese herbs for thyroiditis from her Chinese Medicine practitioner. Physical examination revealed blood pressure 118/70 mmHg and a heart rate of 78 pulses per minute. Her pupils were equal, round, and reactive to light, sclerae were non-icteric and extra ocular muscles were intact. There was no ptosis of the eyelids, no pterygium present, conjunctivas were normal and no cataracts noted visually. Cranial nerves II-X were intact and normal function was noted. Muscle strength was 5/5 in all extremities and deep tendon reflexes were 2/4.

Methods:

Osteopathic manipulative therapeutic evaluation revealed the cranium to be the area of greatest restriction, with significant tissue texture changes noted at the sub-occipital region. The following additional restrictions were noted: thoracic outlet restricted fascially in right rotation, T_1 (Flexed, Rotated and Side-bent - Left) FRS_L, right 1st rib exhalation restriction with a primary bucket handle component, increased paravertebral muscular tension noted bilaterally between T_{12}-L_2, L_5 (Extended, Rotated and Side-bent - Right) ERS_R, left superior innominate shear, left superior pubic shear, left/right sacral torsion, right anterior innominate rotation, and left proximal fibular head anterior.

The patient was evaluated cranially for meningeal and sutural stress patterns with glasses on and off. Her current eyeglass prescription markedly limited her cranial amplitude and

caused a noticeable anterior fluid shift. Her glasses were removed for the remainder of the evaluation and the treatment. She was found to have the following cranial suture restrictions: right maxillary/frontal, left occipital/mastoid, right frontal/parietal, right spheno/squamous, and left premaxilla.

The patient was assessed with acute and chronic headaches, migraine and tension type, possibly secondary to eyeglasses. Somatic dysfunction of the cranium, cervical, thoracic, and lumbar spine, sacrum, pelvis, lower extremity, rib cage and abdominal soft tissue were found.

Treatment:

Osteopathic manipulative therapy (OMT) was performed to all areas listed above utilizing functional, balanced ligamentous tension, muscle energy, visceral, and facilitated positional release techniques. The cranium was treated with a combination of indirect and direct sutural manipulation, fluid and visceral (brain parenchyma) techniques. The treatment was tolerated well and the patient reported a complete resolution of the acute headache.

The patient was then evaluated for cranial strain with her eyes closed and covered to occlude any incoming light. The same evaluation was then performed with her eyes open and the results were compared. With her eyes closed and covered the patient was found to have no cranial strains present, as she had just undergone treatment to remove all above noted strains. When the cover was removed and the eyes opened the patient's cranium immediately changed with noted strains of cranial extension, a right torsion, vertical strain and a left lateral strain pattern. Due to those findings it was determined that there may be a need to prescribe a modification to her eyeglasses to help neutralize the cranial strains. Utilizing ophthalmologic principles as they relate to "Osteopathy in the Cranial Field" the prescription that removed or significantly reduced her cranial strains was:

OD: -4.37 sphere, -1.25 x 023° cylinder
OS: -4.12 sphere, -1.00 x 177° cylinder
+1.00 reading addition bilaterally

The numbers represent an eyeglass prescription. "OD" - ocular dexter - latin for the right eye whereas "OS" - ocular sinister - latin for the left (or evil) eye. The first minus signifies near-sightedness; the number is the strength of the lens (sphere). The second set of numbers is the astigmatism. The minus being the strength of the lens and the degree number is the axis of rotation of that lens (cylinder). The +1.00 is an addition for bifocal lenses.

The patient noted considerable relief in her eyestrain and physical tension with this prescription in the trial frames. She noticed that her entire body felt relaxed and that the pressure in her head had disappeared. The cranial strain patterns noted above were no

longer present with eyes open or closed and covered. The patient was instructed to have ophthalmological prescription filled and to return in two weeks.

The patient returned in two weeks with the new eyeglass prescription. When placing the glasses on her face, she noted a feeling of pressure at the frontal bone that was similar to the feeling presenting just prior to her headaches. This was identified as a cranial vertical strain. The frames were then re-fitted to her face using ophthalmologic principles (face form was adjusted until the vertical strain was removed, the frames were "x'd" with the right lower portion of the lens being adjusted toward the face to remove a small left cranial side-bending rotation, and the pantoscopic tilt was adjusted to balance the muscle tension of the suboccipital muscles). *["x"ing the frames is when one lens is bent forward (the lower part of the lens) and one backward when looked at from the vertical plane*.] The patient was instructed in how to care for the glasses and what to expect from the eyeglass treatment. The fitting of the glasses resolved the vertical strain and the patient's feeling of pressure. A brief cranial treatment to further release the frontal area (ethmoid bone and right frontal/nasal suture restriction) and the brain parenchyma was rendered at that time. She left the office symptom free.

The patient phoned the office the next day to say that her headache symptoms were very aggravated. She was instructed to continue to wear the glasses and take "over the counter" pain relievers as necessary. A return office visit one week later revealed that, after three days of symptom aggravation, the headaches had completely disappeared and her eyestrain was improved, but still present. Additional eyeglass frame adjustment alleviated the feeling of eyestrain (added refinement of face form adjustment). A frontal bone right-sided intra-osseous strain and brain parenchyma release completed this treatment. She was then instructed to return as needed for adjustments of the glasses and for treatment only if symptoms did not improve after seeing her local osteopath.

The patient has been followed for over one year with approximately bimonthly eyeglass adjustments and one revised prescription. Her headaches have completely resolved and she is doing very well in college.

Discussion:

In this case the patient's symptoms appeared to be a direct result of visually induced somatic strain influencing the cranial bones and causing headaches and other complaints. This seems a reasonable explanation due to her unresponsiveness to other forms of care, her response to the OMT and cranial care, ophthalmological prescriptive modification, and then modification of the eyeglasses.

Diagnoses of cranial strain patterns consisted predominately of palpatory tests for the following patterns, which are commonly found in cranial osteopathic examinations [7]:

- flexion
- extension

- torsion (left or right)
- side-bending rotation (left or right)
- lateral strain (left or right)
- vertical strain (superior or inferior)
- compression

Testing for inter and intra-examiner reliability of cranial bone dynamic patterns has been performed with some success [8-13]. A recent study had particularly significant findings for intra-observer reliability for cranial strain patterns as were used in this case report [14]. It can be reasoned that myofascial imbalance caused by her eyestrain resulted in an abnormal tension on the cranial bones that induced the strain patterns which in turn resulted in her headaches. This was deduced by comparing the patient's cranial movement and strain patterns with the eyes closed and covered (no visual input) with the eyes open (visual input). It is surmised that the process of light entering the patient's visual processing system caused cranial strain (visually induced somatic strain or visual somatic strain). This strain was neutralized with eyeglass lenses and frame adjustments giving the patient a cranium that would now accept a treatment and remain stable longer between treatments. Her eyes were able to relax and not place abnormal tensions on the cranium.

This patient's case was complex. The patient's local osteopathic physician treated her well, but her cranial strain pattern continued to return. The suspected cause of this appears to be a possible visual somatic strain. Although each of her previous eye doctors performed the best that he or she could, they were not able to incorporate an osteopathic functional cranial assessment to evaluate the relationship of her eyes or vision to cranial patterns. Also, if optometrists and opticians do not perform thorough eyeglass fittings, this can lead to visual somatic strain [15]. Symptoms related to visual somatic strain are not part of the standard curriculum taught at osteopathic medical schools.

Much of the knowledge of osteopathic visual somatic strain has come about in the last ten to fifteen years from Jim Jealous, DO, Joe Field, DO, Paul Dart, MD and others. They have mapped out the effects of visual strain on the cranial system and worked out corrections for these problems. In this case, the patient's eyeglasses were over-prescribed, a common issue with eyeglass prescriptions [16]. This led to a persistent lateral strain (from over-prescribed cylinder), extension lesion (from over-prescribed sphere), torsion (from incorrect cylindrical axis) and vertical strain, side-bending rotation and sub-occipital muscle tension (from the prismatic effect of incorrectly adjusted frames) each time the patient wore her glasses [17]. These effects were present even with her eyes closed, but were increased when she opened her eyes [17]. Lateral and vertical strains, both being non-physiologic patterns, can cause headaches [18]. These strain patterns can restrict motion of the extra-ocular muscles and can lead to ophthalmologic migraines [19]. At a minimum, this contributed but may have been the sole cause of this patient's chronic headache.

A careful application of the known laws of physics as they apply to optics and the principles of osteopathy in the cranial field allowed a precise, unique, objective eyeglass

prescription and frame adjustment to neutralize this patients visual strain [17]. Cranial or brain parenchyma treatment to aid the body in adapting to the change in the mechanism is necessary in most of the cases. This easing of the visual strain with the correct prescription and frame adjustment can result in cranial pattern shifts that can further change the patient's prescription or require eyeglass adjustment as the cranial strain patterns begin to resolve [20]. Thus it is important to develop a good rapport with these patients and follow their progress closely.

Conclusion:

This case study illustrates that a subset of patients may present with a clinical condition that either affects vision or the vision affects the condition. This dynamic interrelationship can be classified as a visual somatic strain. Functional assessments to evaluate for a visual somatic strain can be used to improve the neuromusculoskeletal head, neck, and postural kinematics where vision plays an important role. Collaborative efforts can be made to develop interdisciplinary co-treatment opportunities between osteopaths, chiropractors, podiatrists, ophthalmologists, dentists, and other allied professionals so that the sufferers of the effects of visual somatic strain can be helped and their quality of life improved. Greater research into this phenomenon should be investigated initially with case controlled and practice based studies.

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Vision induced chronic low back pain: A case report.

Charles Beck, DO

Introduction:

What direct relationship might the eyes or vision play in the causation of low back pain or other symptoms related to physical changes in the fascia (both internally and externally) of the cranium? If the eye muscles, visual reflex centers, or other neurologically related circuitry have a direct relationship with sustained myofascial imbalance, this may be an important part of a clinical differential diagnosis.

A series of case reports involving both spinal and cranial manipulative interventions have discussed a relationship between vision and successful treatment [1-4].

Monaco, et. al., found a positive correlation between ocular correction effects on EMG activity of stomatognathic muscles in children (n=320) with functional mandibular lateral-deviation in a case control study. This showed a relationship between standard prescriptive ophthalmic evaluations and how they could be improved with a functional assessment tool to evaluate any related myofascial interrelationship [5].

Weiner, et. al., performed the first published case series study (n=6) evaluating the use of cranial manipulative treatment of patients utilizing ocular changes for treatment purposes. They found "significant changes in ocular refraction, corneal curvature, and ocular position noted and measured as a concomitant of the use of dental appliances and/or osteopathic craniosacral manipulations in ongoing therapies for treatment of temporomandibular joint (TMJ) syndrome and other related head, neck, and shoulder problems. The near-immediacy in time of these variations and the absence of other reasonable causes suggest that precise monitoring of these patients before treatment begins and during subsequent therapy can assist the practitioner in quantifying the progress and effects of the treatment of chronic head, neck, and swallowing problems [6]." Their six case histories demonstrated "significant changes in hypereye, proptosis, corneal astigmatism (and axis), and refractive error. The magnitude of these alterations ranges from 25% to 300% of the pretreatment condition [6]." They cautioned that, "while the subjective symptom improvement of these cases would have to be regarded as anecdotal, visual parameter analysis of a large patient population may help to provide predictive cause and effect assumptions [6]."

Therefore the purpose of this study is to determine if a relationship can be found between vision and its affect on the cranium, stomatognathic system and posture, and if this relationship can be used for both assessment and treatment of patients in an interrelated and interdisciplinary manner.

Case History:

A 34-year-old white female patient presented with a history of low back pain that has been present for nearly two years. She was currently being seen by her gynecologist for the treatment of hypothyroidism and taking bio-identical hormone supplementation for irregular menses. Her gynecologist referred her to the clinic for a musculoskeletal evaluation of her back pain. She was cheerful on initial presentation and indicated that her back is the only real issue and concern. She stated that other than her back she "feels fine". Her symptoms improved with rest and sleep and worsen as the day progresses. The pain is dull, achy, non-radiating and she points to her lower lumbar spine when asked about its location. She rates the pain as an "8" out of 10, with 10 being most severe.

The patient denies any trauma associated with the onset and further denies any motor vehicle accidents, slips or falls, or other trauma. The patient is employed as an accountant at a local large company. She stated that her back pain is "just getting worse". When asked how long the pain had been present, the reply was "...2 years". In questioning what else might have happened in the time period in her life she responded, "I can't remember any trauma, but that's when I had my bilateral lens implants". The patient stated that the surgery was for her poor vision and that she had been able to see well since the surgery and had not needed corrective lenses to read the eye (Snellen) chart. She denies any other traumatic or pathologic visual problems including: amblyopia, anisometropia, diplopia, strabismus, glaucoma, ophthalmoplegia, pterygium, retinitis, or macular degeneration.

Her predominant medical condition was recently diagnosed as hypothyroidism and hormone imbalance. Surgically of note was the bilateral lens implants in 2006. Medication includes Iodine Plus tablets, 50 mg per day for hypothyroidism; progesterone cream, 0.1 mg daily applied topically. Aside from infrequent mild headaches her main musculoskeletal complaint is the chronic low back pain (L4-S1).

Methods:

Osteopathic manipulative therapeutic evaluation revealed her cranium to be the area of the greatest restriction, with tissue texture changes noted at the suboccipital region. The right occipitomastoid suture was restricted. She had two mildly exaggerated kyphoses, focused around the cervicothoracic junction and at the T_7 vertebra. The C_2 vertebra was rotated right. The thoracic outlet was restricted fascially in left rotation, the C_7 vertebra was ERS_R (Extended, Rotated and Side-bent - Right), the right 1st rib joint exhibited an exhalation somatic dysfunction, there was increased paravertebral muscular tension noted bilaterally between T_1-T_5 and L_3-S_1. L_5 was ERS_R (Extended, Rotated and Sidebent - Right). Additionally, there was left superior immoninate shear misalignment, left superior pubic shear misalignment, left/right sacral torsion, and a right anteriorly rotated innominate. After an initial screen and repeated questioning about the back pain, the blinds in the exam room were closed and the patient was informed that the lights would be switched off. The patient was seated on the exam table, the lights were switched off

and she was allowed to remain motionless for approximately 30 seconds in the darkened room. This experiment is a test for somatic dysfunction that was induced or exaggerated by light (visual somatic strain). When asked at the end of this period how her pain was, she replied, "It's gone". The lights were turned on and she was asked again about her back pain. She reported that it had returned. This experiment was repeated for a total of three times until the patient (and the physician) were convinced that her back pain was related to her eyes. She was then re-examined in the darkened room and, although her somatic dysfunction was still present, its severity was significantly lessened.

The patient was examined cranially with her eyes closed in a darkened room. She was then examined with her eyes open in a lighted room. This was done to maximize the differences. The cranial rhythm presented with good amplitude in the darkened, eyes-closed exam, but was restricted in the lit, eyes-open exam. She was also noted to have a marked lateral strain, a minor cranial flexion, and increased tension in the suboccipital muscles present in the lit, eyes-open exam that was absent in the darkened, eyes-closed examination.

She was assessed with a history of headaches and low back pain worsened by visual input. She presented with hypothyroidism, hirsutism, an irregular menstrual cycle as well as somatic dysfunctions of the cranium, cervical, thoracic and lumbar spine, sacrum, pelvis and rib cage.

Treatment:

Osteopathic manipulative therapy (OMT) was performed to all areas listed above utilizing functional, balanced ligamentous tension, muscle energy, and facilitated positional release techniques. Cranium was treated with a combination of indirect and direct sutural and fluid techniques. The patient tolerated the treatment well. She was then evaluated for cranial strain with her eyes closed and covered to occlude any incoming light. The same evaluation was then performed with the eyes open and the results were compared. With her eyes closed and covered she was found to have no cranial strains present, as she had just undergone treatment to remove the above noted occipitomastoid strain. When the cover was removed and the eyes opened the patient's cranial appearance immediately changed with noted strains of mild, but perceptible cranial extension, a mild right torsion, and a pronounced left lateral strain pattern. It was decided at this time to prescribe eyeglasses to neutralize the cranial strains. Utilizing ophthalmologic principles as they relate to Osteopathy in the Cranial Field the prescription that neutralized her cranial strains was:

OD: -0.12 sphere, DS (no astigmatism)
OS: -0.12 sphere, -1.12 x 77° cylinder

The numbers represent an eyeglass prescription. The first minus signifies near-sightedness; the number is the strength of the lens n diopters (sphere). The second set

of numbers (if present) is the astigmatism. The minus being the strength of the lens in diopters and the degree number is the axis of rotation of that lens (cylinder).

The patient was instructed to get this prescription filled with metal, full-rim frames and to return in two weeks. She was asked to call the office if she needed any assistance before then.

The patient returned in two weeks with the new eyeglass prescription. She noted 80% symptomatic relief in lower back pain with this prescription prior to her entering the office. She noted that her pain had dropped to a "2" on a 10 scale. She was assessed cranially and the frames were fitted to her face using ophthalmologic principles - optical centers of the lenses were centered on the pupils by adjusting the nose pads (this corrected a small right torsion), temple arms were adjusted to keep the frames on the face (temple bend), face form was adjusted until the minor superior vertical strain was removed, the frames were "x'd" with the right lower portion of the lens moving toward the face to remove a small left side-bending rotation, and the pantoscopic tilt was adjusted to balance the muscle tension of the suboccipital muscles. The patient was instructed in care of the glasses and what to expect from the eyeglass treatment. The patient was then evaluated structurally and found to have the area of greatest restriction at L_5 ERS_R (Extended, Rotated and Side-bent - Right), followed by L_3 FRS_L (Flexed, Rotated and Side-bent - Right). These were treated utilizing functional methods. The patient left the office symptom free (pain now a "0"). Follow-up examination was scheduled for two weeks.

At her second follow up appointment she reported that her headaches had not returned at all since the initial evaluation and treatment and that her back pain was greatly improved, but not completely resolved. Evaluation for this visit revealed that the pelvis was the area of greatest restriction, with a left superior innominate shear, left superior pubic shear, left/right sacral torsion and right anteriorly rotated innominate (it was noted that the end feel of this motion was markedly better than her initial visit). She was treated using a combination of high velocity/low amplitude, muscle energy and functional techniques. Her glasses were evaluated cranially and did not need further adjustment at that time.

This patient has been followed for over two years with approximately monthly visits for osteopathic manipulation and checkups on her glasses. She has had two minor revisions on her prescription. Both times the right eye did not change, but after the first revision, the left eye no longer needed any spherical correction (plano). While her back pain has been significantly reduced we are evaluating the need for prolotherapy to see if that could help alleviate any residual low back discomfort or instability.

Discussion:

In this case the patient's symptoms appeared to be a direct result of visually induced somatic strain influencing the cranial bones and causing headaches and chronic lower back pain. This explanation seems reasonable because of the patient's unresponsiveness

to other forms of care, her positive response to the OMT and cranial care, the comparative diagnosis evaluating patient with eyes open and closed or with and without light, the ophthalmological prescriptive modification and then modification of the eyeglasses.

Diagnoses of cranial strain patterns consisted predominately of palpatory tests for the following patterns, which are commonly found in cranial osteopathic examinations [7]:

- flexion
- extension
- torsion (left or right)
- side-bending rotation (left or right)
- lateral strain (left or right)
- vertical strain (superior or inferior)
- compression

Testing for inter- and intra-examiner reliability of cranial bone dynamic patterns has been performed with some success [8-13]. A recent study had particularly significant findings for intra-observer reliability for cranial strain patterns as were used in this case report [14].
In this case the majority of the patient's symptoms appeared to be a direct result of visual somatic strain influencing the cranium and causing lower back pain and other complaints. It can be reasoned that her uncorrected eyestrain (astigmatism) resulted in abnormal tension (lateral strain) on the cranial bones that induced the strain patterns that resulted in the patient's lower back pain. This was noted by comparing the patient's cranial movement and strain patterns with the eyes closed and covered (no visual input) with the eyes open (visual input). The process of light entering the patient's visual processing system resulted in cranial strain (visual somatic strain). This strain was neutralized with eyeglass lens and frame adjustments. This reduced the strain on the patient's cranium so that it no longer adversely influenced the lumbar and sacral area via the dura and its connections. The eyes were able to relax and not place abnormal tensions on the cranium.

Postural reflexes can be subcategorized as the following: visual righting reflexes, labyrinthine righting reflexes, neck righting reflexes, body on head righting reflexes, and body on body righting reflexes [15]. Therefore, it is possible for visual righting mechanisms to have an influence on posture which could affect the ability of the low back to respond to head/neck postural righting. This may be a contributing factor in some patients presenting with vision-related low back pain. Vision, craniomandibular, cervical and postural balance have been found to have clinical interrelationships [16-8].

Baroni, et. al., [19] evaluated two astronauts during space flight using kinematic analysis. "The astronauts were instructed to perform specific axial movements from an erect, upright posture. Their results suggest that visual input for postural control may be independent of gravity-based postural cues." [20]. Another seemingly unrelated study found that a stress response to respiratory systems in women consisted of an increase in vision, headache, and back pain [21]. It is not clear in the case presented in this paper

whether the increased stress secondary to hormonal imbalance may have been related to her particular condition.

With this patient, the pantoscopic tilt of her glasses was a major influence on her postural muscle tension. Pantoscopic tilt (which is the degree of vertical tilt of the lens toward the cheek) [22], can significantly influence the suboccipital muscles of the neck (and dura) directly [23-4], and all of the other postural muscles indirectly. The prismatic effect from light entering the tilted lens of the eyeglasses causes light to deflect (prism) superiorly or inferiorly from the patient's perceived horizon line [25]. If the resulting light does not strike the fovea, the head corrects for this by moving the chin superiorly or inferiorly [25]. This correction results in a prismatic effect on the light entering the lens of the eye that opposes the external prism and returns the focus to the fovea [25]. This optical correction affects the postural muscles that are now required to hold the head at a non-neutral location on the neck [25]. This prismatic effect and its influence on the body can be noticed in automobiles with sloping glass, eyeglasses, and even seemingly eutropic individuals whose fovea do not receive light from the perceived horizon [25].

The anatomical relationship between the cranial and sacral dural attachments [26] could result in lower back pain [27] if the dura was placed under tension from the body's correction of a prismatic effect. When combined with the strain on the postural muscles from the non-neutral head tilt, lower back pain with a visual origin may result.

This patient's case had an initial straightforward presentation, but her pain was not completely due to visual somatic strain. Even after visual correction her symptoms did not completely resolve. Subjectively her pain improved by 80%. Thus, the majority of her pain may be related to a visual somatic strain, since it resolved after prescribing and adjusting eyeglasses.

Much of the knowledge of osteopathic visual somatic strain has come about in the last ten to fifteen years from Jim Jealous, DO, Joe Field, D.O., Paul Dart, M.D. and others. They have mapped out the effects of visual strain on the cranial system and worked out corrections for these problems. In this case, the patient's eyes were not adequately assessed after her surgery to find out if any visual correction was necessary. The patient likely slipped through the system because her vision had no major disturbances. She was able to see 20/20 without correction, although she had some blurriness with her left eye when tested alone. She met the legal requirements to operate a motor vehicle and the standard of care was met [28]. However, her left eye astigmatism led to a persistent lateral strain (from non-corrected cylinder), flexion lesion (from non-corrected sphere), and torsion (from non-corrected cylindrical axis) [25]. These effects of her lens implants were present even with her eyelids closed, but were increased when she opened her eyes [25]. Lateral strains are a non-physiologic pattern and can cause headaches [29]. These strain patterns can restrict motion of the extraocular muscles and can lead to ophthalmologic migraines and back pain [30]. There is a reciprocal relationship between the cranium and the pelvis due to the dural attachments. This contributed to this patient's low back pain and headaches.

Conclusion:

This case study illustrates that a subset of patients may present with a clinical condition that either affects vision or the vision affects the condition. This dynamic interrelationship can be classified as a visual somatic strain. Functional assessments to evaluate for a visual somatic strain can be used to improve the neuromusculoskeletal head, neck, and postural kinematics where vision plays an important role. Collaborative efforts can be made to develop interdisciplinary co-treatment opportunities between osteopaths, chiropractors, podiatrists, ophthalmologists, dentists, and other allied professionals so that the sufferers of the effects of visual somatic strain can be helped and their quality of life improved. Greater research into this phenomenon should be investigated initially with case controlled and clinical based studies.

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Dentofacial orthopedics and maxillary morphogenesis: A case series.

Theodore Belfor, DDS

Introduction:

Studies have found that modification of the craniofacial region may be possible. A significant amount of growth potential may reside in the craniofacial system throughout life [1]. Dentofacial orthopedic therapies amount to growth guidance. Rapid maxillary palatal expansion in children is a common event producing [pw1]changes in maxillary size and shape which has been shown to affect the airway [2], less [pw2]common is slow palatal expansion used with adults. The focus of this paper is to explore slow palatal expansion in adults combined with changes in swallowing pattern and occlusion provided by the Homeoblock™ removable orthopedic/orthodontic appliance. It is theorized that this appliance can provide an environmental stimulation resulting in an epigenetic response, namely maxillary morphogenesis. Morphogenesis is defined as "the biological process that causes an organism to develop its shape". While changes in dentofacial orthopedics are accepted in children this [pw3]study will discuss some adult patients treated with the Homeoblock™ and its affect [pw4]on maxillary morphogenesis and airway function.

Case Studies:

Three adult case studies were selected to demonstrate maxillary morphogenesis, [pw5]two females (age 79 years old and age 60 years old) and one male (60 years old). These patients were treated for maxillary underdevelopment which can affect occlusion and airway space due to tongue hard [pw6]palate relationship. To help assess if there is maxilla underdevelopment pre and post treatment may be demonstrated by orbital changes reflected by the eyes[pw7]. Since the superior border of the maxilla is the inferior border of the orbit it [pw8]is suggested that a change in maxillary morphogenesis may affect the lower eyelid.

Treatment and Intervention:

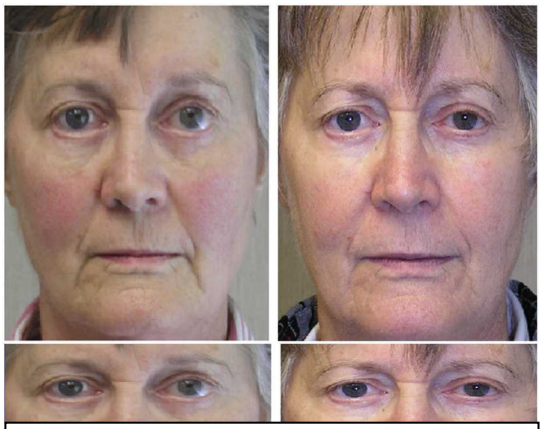
Upper and lower Homeoblock™ appliances were fabricated. Each patient wore the Homeoblock appliance for a minimum of twelve months. The Homeoblock™ consists of "Adams clasps" on the bicuspids with a baseplate that incorporates a palatal expansion jack screw. The appliance is relieved from the palatal tissues. Flap springs rest on the anterior teeth and a Hawley archwire extends from left to right canine. A bite block is placed on the second bicuspid and first molar on the less developed side. Bird beak pliers and/or three prong pliers are used for the adjustment of clasps.

Each patient wore the Homeoblock ™ appliance daily from 3:00 PM to 8:00 AM. Each patient wore the appliance initially for one week without activation. Standardized facial, intraoral photos and a Cone Beam Computed Tomography (CBCT), iCAT scan was taken when the Homeoblock™ was inserted. The Homeoblock™ appliance was

advanced one half turn .012mm after the first week and each successive week (slow palatal expansion). Each patient was seen after 3 weeks and fit and compliance were reviewed. Post treatment facial, intraoral and CBCTs were taken after 6-12 months.

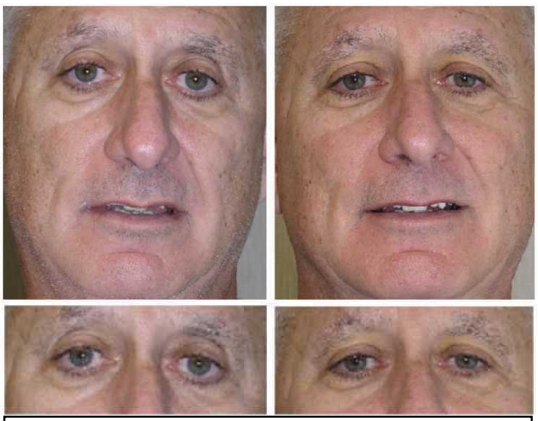
Results:

The following pictures (*Figure 1*) illustrate that with these three patients the [pw9]remodeling of the maxilla in an upward and forward direction resulted in what appears to be a tightening of the lower eyelid. Improved tongue position, tone, and the resulting increased pharyngeal airway size was found with each patient (*Figure 2*). Improvement of airway space was found in these three cases as [pw10]demonstrated by an increase in pharyngeal airway radius. Since airflow is a factor of r^4, the radius to the fourth power, the study indicates that airway was improved considerably. [Poiseuille's Law: $\Delta P = 8\mu LQ$] Lastly [pw11]all patients had both their nares become wider and more symmetrical, which allows for less airway resistance and improved airway function (*Figure 3*).



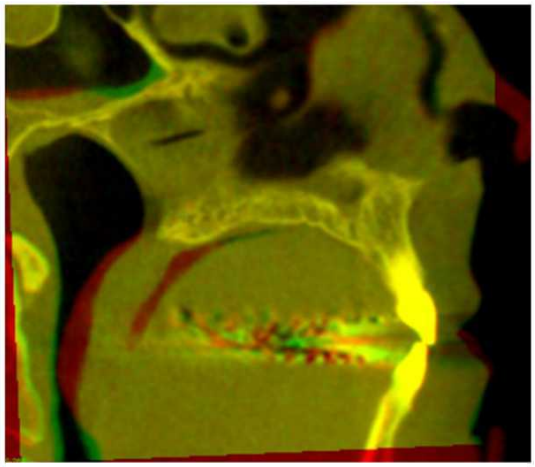
Before After
60 year old famale

Before After
70 year old famale

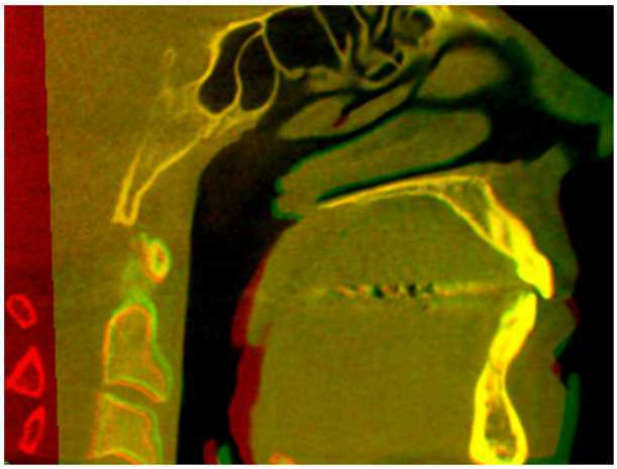


Before After
60 year old male

Figure 1 – With these three patients it appears as if a remodeling of the maxilla in an upward and forward directionhas occurred secondary to the dental appliance resulting in a tightening of the lower eyelid.



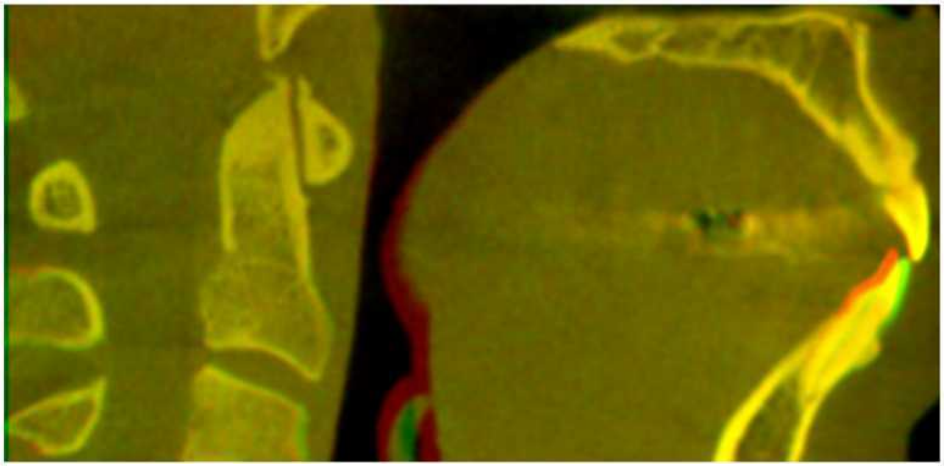
Female Age 70



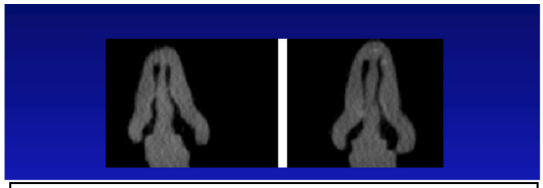
Female Age 60

Figure 2 - In the following case studies posterior aspect of the tongue show its improved position, tone, and the resulting increased pharyngeal airway size.

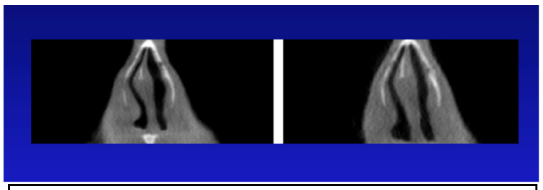
Note: These images have been created after registering before and after CBCT scan using Analyze 10.0 from the Mayo Clinic.



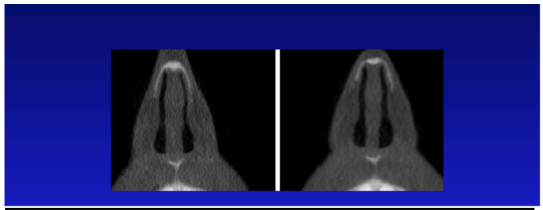
Male Age 60



Before After
70 year old female



Before After
60 year old female



Before After
60 year old male

Figure 3 - Epigenetic interactions can be complex and while incompletely understood although positive changes in symmetry and width of the nares were found in these case.

Discussion:

Once nurture seemed clearly distinct from nature[pw12]. Now it appears that our diets and lifestyles can change the expression of our genes. External influences seem to be able to influence a network of chemical switches within our cells[pw13] collectively known as the epigenome. This new understanding may lead us to potent new medical therapies such as dental orthopedic appliances affecting maxillary and mandibular morphogenesis .

While epigenetic interactions are numerous, complex, and incompletely understood it does appear that the external body is inherently programmed for symmetry. Therefore[pw14] the changes in eye musculature and orbital shape, pharyngeal airway space, and nares symmetry could be a result of maxillary morphogenesis relating to the spatial matrix theory [3]. Singh suggests that it is "likely that an underdeveloped midface presenting with palatal insufficiency (due to gene-environmental interactions) could be associated with malocclusions, and may simultaneously predispose to temporo-mandibular joint dysfunction (TMD) and upper airway compromise, such as obstructive sleep apnea (OSA) [3]." "Thus, in order to reestablish or enhance craniofacial homeostasis, special attention must be given to non-mandibular constraints in patients who present with a retrusive mandible, OSA or TMD. In other words, the craniomaxillary structures might need to be more thoroughly assessed before planning the final positions of the crowns of teeth [3]."

Therefore[pw15] maxillary and mandibular morphogenesis can also affect the airway[pw16] and morphogenesis is a physiologic phenomenon [4,5]. Increasingly we understand that development is under epigenetic control and recent research has tied morphogenesis to epigenetic changes [6]. The epigenome is affected by altering function such as teeth contact and stomatognathic functions (e.g., swallowing). The results involve genetic expression or affecting genes that had[pw17] not yet been expressed. Hence affects [pw18]to the airway space and function can be quite dramatic.

While these cases have shown improved symmetry in dentition, airway, nares and facial expression[pw19] we postulate that improved symmetry relates to improved function. Likewise improved function is consistent with improved symmetry. Within the study of biology asymmetry is associated with "poorer developmental homeostasis at the molecular, chromosomal and epigenetic levels [7]" and [pw20]both genomic and environmental changes can increase asymmetry[pw21] which represents a deterioration in developmental homeostasis apparent in adult morphology [7]. Symmetry aside from just relating to improved function[pw22] has many social and environmental implications [8].

Recent studies are linking craniofacial development to the problem of sleep apnea [9,10]. For example, airways that are more elliptical in shape and mesiolaterally oriented had a decreased tendency toward obstruction. Improve the development and we reduce the apnea[pw23]. All biologic systems are programmed for self correction[pw24]. It has become increasingly evident in recent years that development is under epigenetic control [10]. The

phenomenon of epigenetics can be a dynamic part of the future for medicine and dentistry. In effect [pw25]it is the body actively healing the body.

Conclusion:

These three cases demonstrated how modifications of tissues in the craniofacial region can occur with adult patients in their 6th and 7th decade of life. The Homeoblock™ dental appliance utilizes principles of epigenetics and the concurrent morphogenetic responses produced with dentofacial orthopedics. The changes were represented in both soft tissue and bone and are in the direction of improved facial and airway development. Greater research is needed to determine if this methodology can be generalized to the population at large and if the changes are lasting and relate consistently to improved clinical findings.

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CMRT and acupuncture in the treatment of dysmenorhea (oligomenorhea): A case report.

Christine D. Benner, DC, LAc

Introduction:

Amenorrhea is the absence of a menstrual period in a woman of reproductive age [1]. Oligomenorrhea is infrequent menstrual periods occurring at intervals of greater than 35 days, with only four to nine periods in a year. While related to hormonal imbalance or female reproductive abnormality conditions it can also be found commonly with female runners, swimmers and ballet dancers who menstruate infrequently in comparison to nonatheletic women of comparable age or not at all (amenorrhea) [2,3]. In some instances the degree of menstrual abnormality is directly proportional to the intensity of the exercise. Eating disorders such as anorexia or blulimia can also result in oligomenorrhea [4].

Dysmenorrhea is menstrual pain that interferes with daily activities which is related to any pain during menstruation whether it is normal or abnormal. Menstrual pain is often used synonymously with menstrual cramps, but the latter may also refer to menstrual uterine contractions, which are generally of higher strength, duration and frequency than in the rest of the menstrual cycle. Dysmenorrhea may precede menstruation by several days or may accompany it, and it usually subsides as menstruation tapers off [5].

"Health practitioners are exposed to multiple approaches towards the management of menstrual pain. Clinical and social viewpoints target the causation, development, diagnosis, manifestation and management of primary dysmenorrhea." "Menstrual pain is a prevalent experience yet it is socially taboo for conversation; as such, it poses a hindrance to its management. The communication between the doctor and patient is a critical barrier point between establishing a diagnosis and determining an appropriate treatment plan [6]."

An interdisciplinary treatment plan that can vary to treat patients with the multi-causal nature of female related menstrual type disorders may be needed for a specific subset of patient. With the risk benefit ratios of pharmaceutical interventions any attempt to utilize alternative type methods that offer low risk and some benefit should be investigated. This case report presents a patient with an intermittent menstrual cycle with breast tenderness which had been chronic for over 10 years. The patient was a chiropractic wellness patient [7] yet never considered that chiropractic could facilitate her female related conditions until she discovered that her chiropractor was also a licensed acupuncturist.

Case History:

A 31-year-old female patient presented initially to this office for low back and foot pain 5 years prior and wanted preventative wellness care. Approximately 5 years into care, February 2008, the patient discussed the possibility of utilizing acupuncture to help her cope with an irregular menstrual cycle, having only light periods (1-2 days) 2-3 times a year for over 10 years or more.

The patient presented with complaints of persistent breast tenderness every week for years only having relief during her infrequent menstrual periods. She had no other premenstrual syndrome type symptoms and indicated that her mood and energy levels were good. Her gynecologist was unable to find anything clinically related to her unusual cycle and breast tenderness which had been present for over 10 years.

Methods/Intervention:

The patient was assessed and treated using sacro occipital technique (SOT) chiropractic, chiropractic manipulative reflex technique, and acupuncture protocols. She was treated for a category one which involves pelvic block placement to reduce pelvic torsion and improve sacral nutation [8]. R+C factors were used to isolate a cervical – lumbar relationship and the lumbar vertebra were adjusting in a direction and vector that would decrease cervical spine local pain and swelling (e.g., L3/4 = C2/3) [9]. In addition the T6-8 mid-thoracic veretbra were adjusted for anteriorities, T3/4 posterion, and C1 was rotated to the right and C2 to the left. Occipital fiber line one area six [10] was positive relating to T8 and CMRT [11,12] for liver.

Acupuncture evaluation found her pulse was wiry and full, normal rate at 72 beats per minute. Treatment focused on balancing of conditions relating to liver and adrenal related constitutions as found in acupuncture theory.

Results:

Following one year of integrating SOT CMRT for liver (T8), adrenals (T9), and acupuncture her condition has been improving and her cycle has been regulating with periods of monthly cycling and then possibly up to 3 months of amenorrhea particularly during times of high stress and anxiety. She is still under care and appears to be consistently improving and aside from one 1-2 week episode of breast tenderness, this symptom has subsided.

At her last office visit May 2011 she has had period every month this year so far, but the breast tenderness has been coming back. The breast tenderness had been non-existent through out 2010. SOT finding for this office visit found a left short leg (pelvic torsion) category one, C3 right transverse process sensitivity was relieved with L3 lumbar rotation to the left. Occipital line one area six was active with right hand web very tender and CMRT was performed for the liver. Some adrenal reflex activity was noted but not treated on this office visit. C1 adjusted to the right and C2 was adjusted to the left. The

patient mentioned that she thinks her body stress pattern is part of her spiritual learning curve and that her symptoms appear more pronounced when she needs to recognize the need for movement and/or change. From an acupuncture standpoint this is interestingly, because it this psychological pattern is consistent with the Wood Element that is associated with the liver meridian. Spring being the time of the year for dominant liver energy (qi), and liver qi is associated with a time of change and movement in our lives.

Discussion:

Both chiropractic [6,13-6] and acupuncture [17-9] have some evidence to support its use for conditions relating to dysmenorhea, amenorrhea, and oligomenorhea. Collaborative acupuncture and chiropractic care for symptoms of dysmenorrhea has not been extensively discussed in the literature.

One two case study described application of SOT and CMRT by Courtis and Young. "Two cases involving eighteen-year-old students are detailed with differing chiropractic approaches and treatments discussed along with their possible mechanisms. Each patient received asymmetrically placed pelvic wedges (blocking) and cranial manipulative therapy and in one case chiropractic manipulative reflex therapy (bloodless surgery) was performed. In both cases, there was successful resolution of the patients' symptoms [20]."

Treatment of pelvic imbalance by chiropractic care has been found to have some rational. "A convenience sample of 36 female students from the Macquarie University Master of Chiropractic program who participated in this study all completed a Moos Menstrual Distress Questionnaire (MDQ) [21]." The study found a "strong correlation was established between dysmenorrhoea and sacroiliac joint motion palpation dysfunction [21]." Another study described "chiropractic care of a patient with chronic low back pain located in the region of L4, L5, the lumbosacral and sacroiliac joints, as well as primary dysmenorrhoea [14]." Following chiropractic treatment to the lumbosacral region the "patient's response to care ranged from a progressive reduction to complete loss of all reported symptoms [14]."

In an attempt to determine if hormonal changes relating menstrual stress could be affected by chiropractic care, a pilot randomized control study was performed**.** The primary objectives of the "study were to compare the effect of spinal manipulation (SMT) vs. sham manipulation on a) circulating plasma levels of the prostaglandin F2a metabolite, 15-keto-13,14-dihydroprostaglandin (KDPGF2a), b) perceived abdominal and back pain and c) perceived menstrual distress in women with primary dysmenorrheal [15]." Kokjohn et al concluded that the "… randomized pilot study suggests that SMT may be an effective and safe nonpharmacological alternative for relieving the pain and distress of primary dysmenorrheal [15]."

A case report indicatesd that collateral meridian acupressure therapy treatment may be effective in relieving the associated symptoms of dysmenorrhea. The carryover effect that occurred during care might suggest that there is a potential to produce a long-lasting effect on dysmenorrheal [22]. Acupuncture as a therapy, and acupressure as self-treatment,

are increasingly widely used for gynecological conditions, a systematic review of controlled trials of acupuncture or acupressure for gynecological condition were review the scientific literature on their effectiveness. White concluded that while doubt remains about the effectiveness of acupuncture for gynaecological conditions both acupuncture and acupressure appears promising for the treatment of dysmenorrhoea [17].

"In a randomized controlled trial plus non-randomized cohort, patients with dysmenorrhea were randomized to acupuncture (15 sessions over three months) or to a control group (no acupuncture). Patients who declined randomization received acupuncture treatment. All subjects were allowed to receive usual medical care [18]." The study noted that "additional acupuncture in patients with dysmenorrhea was associated with improvements in pain and quality of life as compared to treatment with usual care alone and was cost-effective within usual thresholds [18]."

In a comparative study that "was undertaken to identify effects of the SP-6 acupressure on dysmenorrhea, the skin temperature of the CV2 acupoint and oral temperatures in the college students. Data was collected from May 1 to August 31, 2002. A total of 58 students from two universities participated in the study. Both groups were pretested before the intervention for three variables', the intensity of dysmenorrhea, skin temperature of the CV2 acupoint and oral temperature. Then, SP-6 acupressure was provided for 20 minutes for students in the experimental group [19]." The instruments used in this study included the Visual Analogue Scale, Menstrual Attitudes Questionnaire Scale, and a Stress scale was utilized for pre and post assessments. The study found "statistically significant differences in the intensity of dysmenorrhea 30 minutes after the intervention [19]."

Conclusion:

As with all case reports it is difficult to make generalizations since no controls, sham procedures, or randomization is utilized to address issues of placebo, ideomotor, regression to the mean and other types of effects. Yet the chronicity of the patient symptoms, over 10 years, and the temporal relationship between treatment and response to care is of interest. It is also of interest that the patient was receiving chiropractic care on an ongoing preventative basis but not until the treatment changed to include CMRT and acupuncture was there a change in her symptomatolgy. There is hope that this study may generate greater acupuncture and chiropractic interdisciplinary care relationships that will help patients gain an option for therapy that offers a lower risk than medications or other more invasive procedures. Research should be taken to evaluate whether a subset of patients may be better suited for this alternative method of care or whether this case was an anomaly.

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Chiropractic, sacro occipital technique, and treatment of patients with nonmusculoskeletal conditions such as asthma or allergies.

Charles L. Blum, DC

Introduction

To many in alternative healthcare, chiropractic is considered firmly entrenched in the complementary alternative medical (CAM) arena. For instance, one study described the use of CAM therapies by a large proportion of patients [n=2055] as the result of a secular trend that began at least a half century ago. "This trend suggests a continuing demand for CAM therapies that will affect health care delivery for the foreseeable future [1]." CAM therapy was used by adults in the United States (US) from 1997 – 2002 and was one of the most commonly used modalities in 2002, representing 15 million US adults [2]. The study by Tindle et al found that "the prevalence of CAM use has remained stable from 1997 to 2002. Over one in three respondents used CAM in the past year, representing about 72 million US adults [2]."

Chiropractic and Nonmusculoskeletal Care

Since its inception, the chiropractic profession has had patients report improvement of non-musculoskeletal complaints with the care rendered. Often times the care offered went beyond just spinal manipulation and included dietary or lifestyle counseling, reflex manipulative techniques, herbal or nutritional supplementation, and various other types of integrative methodologies. Due to these ongoing clinical reports, a practice-based study was performed by Hawk et al and investigated "characteristics that might contribute to people's seeking chiropractic care for nonmusculoskeletal complaints [3]."

In a national [4] and then later multinational [5] study by Leboeuf-Yde et al, they found that a portion of "patients with self-reported nonmusculoskeletal symptoms report definite improvement after chiropractic care, and very few report definite worsening [5]."

Since some benefit has been found from chiropractic treatment of non-musculoskeletal complaints with related low risk, a systematic review [6] was performed with implications for whole systems research. The review found that "evidence from controlled studies and usual practice supports chiropractic care (the entire clinical encounter) as providing benefit to patients with asthma, cervicogenic vertigo, and infantile colic. Evidence was promising for potential benefit of manual procedures for children with otitis media and elderly patients with pneumonia [6]."

Chiropractic and Wellness Care

The World Federation of Chiropractic's "Consultation on Identity" found that only 6% of patients seek wellness care from chiropractic providers [7]. However, the fact that a minority of patients currently seek wellness care from chiropractic providers may have more to do with consumers' current understanding of chiropractors' actual scope of practice than with the acceptability of chiropractors as wellness practitioners. Indeed, practicing chiropractors currently differ substantially on whether they provide one therapeutic modality or a "complete system of healing [8]."

Therefore, the chiropractic approach of the doctor may have some influence on the types of patients that may seek their care and sacro occipital

technique appears to offer a "complete system of healing." That may explain why in contrast to the 6% of patient found seeking wellness care from chiropractic providers [7] the study [n=1316] by Blum et al [9] found that "more than 40% of chiropractic patient visits were initiated for the purposes of health enhancement and/or disease prevention [9]," from sacro occipital technique practitioners.

A survey questionnaire sent to parents of an active group of pediatric patients (2000-07) (n=127) elicited 37 responses from active patients under age 12 who had presented for treatment of nonmusculoskeletal complaints. In all cases active chiropractic care consisted of sacro occipital technique and cranial pediatric treatments, with ancillary procedures to improve neurological function, when clinically indicated. These included cross patterning, biofeedback, early intervention, targeted exercise, nutritional support or homeopathic allergy desensitization. Significant improvement was reported in 36 of the 37 patients receiving predominately sacro occipital technique chiropractic care [10].

CAM Therapies, Asthma, and Allergies

Researchers investigating CAM have attempted to better understand nonmusculoskeletal type presentations such as asthma and have concluded that physical modalities such as chiropractic can also help with this condition [11]. Krouse and Krouse found that while allergic and other types of rhinosinusitis patients commonly use traditional therapies including medications "many patients also attempted a variety of complementary treatments, including dietary management, herbal therapy, exercise, and chiropractic [12]." The study's "findings demonstrated that patients employ both traditional and complementary therapies before seeking the care of an otolaryngologist [12]." Since surgery is commonly associated with some risk it is important to note that they also found "that, despite aggressive medical and surgical therapy, many patients continue to remain symptomatic [12]."

Chiropractic as a "complete system of healing" can involve inclusive interventions and not only spinal manipulative in nature. This perspective would expand its use in the wellness and preventive field of care that is non-pharmaceutically or surgically oriented. There is reason to promote that stress and immune function have a significant

relationship [13-15] and a recent study suggested "that chiropractic care can help balance immune system functioning and relieve asthma symptoms as well as colds and allergies [16,17]."

Chiropractic, when practiced as a system of healing and not solely as spinal manipulation, encompasses the need to investigate the relationship between dietary influences and allergies. "For doctors of chiropractic, the ability to diagnose and treat food allergy can make the difference between success and failure. Many patients who consult doctors of chiropractic suffer from migraine headaches, joint, and muscles pain, and other illnesses that food sensitivity can intensify. Failing to identify these foods can prevent successful treatment [18]."

Chiropractic in the public health arena has noted that "the exceptional growth of allergies in recent years has been attributed to an increase in hygienic conditions which is linked to an under development of the immune system [19]." With patients that fit this subset of immune compromise Chalk and Chalk note "this can be counteracted by the use of beneficial bacterial cultures (probiotics) which can provide a safe alternative for immune development [19]." They propose that "in particular, antibiotics, Caesarian deliveries and the lack of fermentation of our foods may be compromising our body's ability to develop a strong immune system [19]." In fact Isolauri in the American Journal of Clinical Nutrition reported that "the human diet once contained several thousand times more bacteria than it does today [20]."

Conclusion

Chiropractic care is part of CAM therapies and in many instances may be considered a complete system of healing and not solely spinal manipulation. There are various methods of chiropractic care and some may better focus on wellness, preventative, and nonmusculoskeletal type care or interventions. The evidence is slowly emerging to confirm chiropractic care does appear to be a reasonable intervention for some non-musculoskeletal type patient presentations particularly when weighing its low-risk versus the higher risks of medications or surgery. It is clear that when chiropractors offer care for patients with non-musculoskeletal presentations, an awareness and understanding of when it may be appropriate to refer for allopathic co-management will be essential.

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Hyperhidrosis: Is there a chiropractic solution?
Charles L. Blum, DC

Introduction:

Hyperhidrosis (HH) affects approximately 3% of the population. In one study a total of 508 patient records (266 patients from Canada; 242 from the United States) were reviewed; 62.8% of those patients were female. The most common presentation was axillary hyperhidrosis in 73.0% of patients. Most of the patients were moderately to severely affected by their hyperhidrosis, with Hyperhidrosis Disease Severity Scale scores of 3 or 4. There were trends found of facial and scalp hyperhidrosis affecting more men than women and being triggered by food much more frequently than in other sites of hyperhidrosis [1].

Currently the most common therapies starting from least invasive to most invasive are: (1) psychological, biofeedback, and hypnosis; (2) tap water and possibly dry-type iontophoresis; (3) botulism toxin A injections; and (4) thoracoscopic sympathectomy.

The recommendations of the Canadian Hyperhidrosis Advisory Committee used an " algorithm designed to consider both disease severity and location. The Hyperhidrosis Disease Severity Scale (HDSS) provides a qualitative measure that allows tailoring of treatment. Mild axillary, palmar, and plantar hyperhidrosis (HDSS score of 2) should initially be treated with topical aluminum chloride (AC). If the patient fails to respond to AC therapy, botulinum toxin A (BTX-A; axillae, palms, soles) and iontophoresis (palms, soles) should be the second-line therapy. In severe cases of axillary, palmar, and plantar hyperhidrosis (HDSS score of 3 or 4), both BTX-A and topical AC are first-line therapy. Iontophoresis is also first-line therapy for palmar and plantar hyperhidrosis. Craniofacial hyperhidrosis should be treated with oral medications, BTX-A, or topical AC as first-line therapy. Local surgery (axillary) and endoscopic thoracic sympathectomy (palms and soles) should only be considered after failure of all other treatment options [2]."

Psychological, Biofeedback and Hypnosis: There is a debate on whether HH are associated with some personality features such as anxiety or stress, or whether the psychological symptoms are due to negative social feedback from early life. In one study they found that "higher scores of all subscales of character dimensions in hyperhidrosis patients suggest that HH is not related with social phobia or personality disorder [3]." Shenefelt found that biofeedback can improve cutaneous problems that have an autonomic nervous system component. For instance biofeedback of galvanic skin resistance (GSR) along with hypnosis can help improve patient's presenting with hyperhidrosis [4].

Iontophoresis and Botulism Toxin A: If psychological, biofeedback or hypnosis fail to control a patient's HH then usually the next step involves tap water iontophoresis [5] or possibly dry type iontophoresis. While a dry type was found effective in one study it was

not without secondary consequences as the pathologic examination of patients who received this treatment showed some occlusions and destruction of intraepithelial eccrine ducts on the treated palms [6]. However if they are not effective then the next step in an allopathic approach would be injections of botulinum toxin type A (BTX-A) [5]. Malliard et al found that incorporating hypnosis with the BTX-A could be helpful [7].

Thoracic Sympathectomy: There is some conflicting information about what is the best level for sympathetic nerve ablation. "The findings of a study by Katara et al showed that T2 ablation in thoracoscopic sympathectomy for palmar hyperhidrosis was as effective as T2-T3 ablation in terms of symptomatic relief, recurrence, compensatory hyperhidrosis (CHH), and patient satisfaction [8]. However in two other studies discussed a more effective intervention when a T4 sympathectomy was performed. Chang et all found that "different from the current procedure of T(2) or T(3) sympathectomy for palmar hyperhidrosis, T(4) sympathectomy would be a better and more effective procedure with minimal long-term complications [8]. A possible side effect of sympathectomy can be CHH however Yang et all found that the rates of occurrence and severity of CHH were found to be lowered with transection of the sympathetic chain at T4 versus T3 which had a higher incidence of CHH [10].

While not an extensive study it is certainly of interest that 2 case reports using a novel diagnostic method (medical intuition) with acupuncture and homeopathy to treat HH found that after 8 weeks of therapy the two patients were free of symptoms [11].

Methods:

From a biological plausibility perspective an imbalance within the autonomic nervous system may be contributing to a subset of HH presentations. Therefore while investigations into the region of T4 for palmar HH, there may also be a need to investigate T9 and its related chiropractic manipulative reflex technique (CMRT) [12] protocol. Sacro occipital technique (SOT) attempts to have rules that help us generalize patient presentations however we need to be careful that as we generalize we do not lose sight of normal variants and the commonly diffuse somatovisceral and viscerosomatic innervations. Therefore with all indicators present it would not be unreasonable to look to regions above or below the T9 level as well as occipital fibers 1 or 6, which may indicate vertebral levels T10 or T8 respectively [13-6].

With excessive sympathetic stimulation it may be necessary to find various way to stimulate the parasympathetic system such as pressure over the eyes (when closed) to clavicular decompression used in CMRT (T1) for the heart [12]. DeJarnette discussed in his book on Chiropractic First Aid that "gentle pressures, with warm hands, and slow movements all tend to stimulate the parasympathetic system [17]." Also since the parasympathetics originate from the cranial (cranial nerve parasympathetics) and sacral (nervi erigentes) regions any nerve entrapment, dysafferentation [18], or localized dysfunction should be evaluated and treated.

Discussion:

Some novel methods described by DeJarnette that may contribute to stimulation of the parasympathetic nervous system and ultimately balancing the autonomic nervous system to improve the symptomatic picture for a patient with HH. Having not been investigated in clinical research they may be worth further investigation.

In Dr. DeJarnette's book entitled, "Sacro-Occipital Technic of Spinal Therapy" published in 1940 an extensive, complete detail of the developments of Sacro Occipital Technic presented up to that time. In that book he describes his parasympathetic technique, is used with the shoulder contact that is similar to the postganglionic application in the CMRT procedures. In his 1940 text he gives specificity to the contact, which has components of a "Vagal Contact" and "Spinal Accessory Contact" when applying the parasympathetic, or with regards to Bloodless Surgery, the postganglionic technique [12].

Like the postganglionic technique in CMRT DeJarnette states, "The parasympathetic technic is always the last technic used, unless the patient is purely a parasympathetic type [19] [page 112]." DeJarnette continues that the shoulder contact in CMRT may be a combination of both the vagal and spinal accessory contacts. DeJarnette indicates, "The spinal accessory technic is used first to control the parasympathetic pain of a viscera lying with the trapezius triangle." In instances where the viscera lies outside the trapezius triangle (inferior to the twelfth thoracic) then the vagal contact is tested first to determine if it controls the pneumogastic organs, and if it fails then it would indicate that the vagus has reflexed to the spinal accessory [19] [page 102].

DeJarnette's Vagus Contact: "The vagus contact in the cervicals is exactly medial to the anterior neck triangle formed by the sternocleidomastoid and the scaleni muscles." The contact from the right side is taken with the doctor on the right side of the supine patient. The doctor contacts the inside of the anterior neck triangle with fingers gently grasping under the medial border of the sternocleidomastoid muscle and holding the contact upon vertical descent of the nerve. The fingers will feel the pulsation of the carotid artery and the pulsation must be lateral to the fingers to assure the correct contact. For the left side the positions and contacts are reversed [19] [page 103].

Rule of Vagus Contact: "The lower the contact is taken towards the clavicles the greater will be the effect upon the superior tissues innervated by the vagus. The higher the contact is taken, the greater the effect upon the inferior viscera innervated by the vagus." Thus when treating the ascending colon your contact would be more cephalward, just opposite the atlas and medial side of the sternocleidomastoid muscle, and while treating a condition in the throat the contact would be caudalward and located at the anterior triangle above the clavicle. The liver contact would be on level with the axis while the gastric contact would be slightly inferior to the liver contact [19] [page 104-5].

Use of the Vagus Contact: When a viscera is manifesting signs of overactivity, such as pain, tension, inflammation or engorgement, the vagus is overactive. DeJarnette

discussed how this "overactivity" can be treated by "vagus inhibition". The vagal contact with this condition is given by gently holding the finger contact onto the vagus nerve at the cervical shoulder region. DeJarnette estimated that it would take three minutes of contact to "completely relax a contracted viscera or to remove visceral pain" [19] [page 81].

DeJarnette notes regarding stimulation or inhibition of the vagus (parasympathetics):

> "When the heart is rapid, the vagus must be stimulated. This is done by quick vibratory movements over the vagus. This is applied with the thumbs or by pinching the skin over the contact area. When the heart is slow the vagus must be inhibited." So vagal inhibition is performed by a continuous stable soothing contact and stimulation by a vibratory or pinching type action contact.

While chiropractic has had a history of treating autonomic and visceral related conditions [20-2] recently DeJarnette's method of bloodless surgery or CMRT has been developing some evidence base in recent years [16, 23-9]. With the various methods of intervention for HH it may be that further study into SOT's CMRT methods may offer a low risk option for patients suffering from HH.

Conclusion:

In the care of patients, physicians should initially focus on "do no harm." Therefore low risk procedures that may offer benefit to a specific segment of the patient population should be investigated, particularly with patients presenting with HH. While psychological, biofeedback, and hypnosis appear to be low risk procedures it is not as clear with iontophoresis, BTX-A, and sympathectomy what complications or side effects may be unwanted and permanent. However before protocols such as CMRT for HH are readily suggested further study is clearly indicated if there is indeed a subset of patients presenting with HH that respond to these interventions.

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Cervical traction, TMJ disorders, chiropractic and dental co-treatment: A case report.

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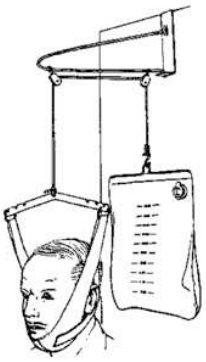
Introduction:

Cervical traction has been discussed in the literature for years. This method of treatment for neck pain has been found to be an effective tool in treatment of cervical spine conditions such as disc related compression, osteoarthritis, myofascial tension secondary to temporomandibular joint (TMJ) disorders, and acceleration/deceleration injuries without post trauma instability [1-5].

Although cervical traction is rarely dangerous to perform, there are still some contraindications that must be taken into account when performing this treatment in a clinical setting or prescribing it for home use. With severe cervical spine pain or dysfunction, a thorough examination and radiographic investigation may need to be performed. It is essential to rule out any neoplastic conditions, unstable post-traumatic cervical spinal segments, syndromes associated with joint instability (e.g., Marfan syndrome), and thoracic outlet syndrome where traction may compress the brachial plexus between the anterior and mid scalenus muscles [1].

Shore et al noted "that patients in cervical traction for the treatment of cervical spine syndromes frequently complain that the traction makes them worse. It is possible that such patients may be suffering from TMJ symptoms [6]." This was because the majority of all cervical traction units utilize a chin strap which causes pressure or compression to the mandible and resultant increased stress to the TMJ condyles, discs, and related joint soft tissue. As a means to deal with this pressure or stress to the TM, they suggested that "the physician treating a patient with cervical traction should consider prescribing an occlusal splint for patients without posterior teeth. The splint should be designed to distribute the stresses through the mandible to the maxillae via the teeth, splint, and TMJ [6]."



The purpose of this article is to discuss the use of a novel form of cervical traction, Pronex Cervical Traction, as a means to facilitate the positive effects of cervical traction due to the application of traction without any chin or mandible pressure as a means to limit any iatrogenically caused temporomandibular joint (TMJ) disorders [7-9].

Case History:

The patient presented as a 66 year- old female, happily married, 5'10" tall with significant pain and stiffness in her neck and crepitus (popping and clicking) when using her jaw. She was referred to me by her dentist for cranial and sacro occipital technique (SOT) treatment for conditions interrelated to her TMJ disorders (TMD). Her presenting symptoms consisted of neck stiffness and pain with loss of range of motion. She could not tolerate cervical manipulation. The pain and stiffness disrupted her sleeping, related to TMD problems, and adversely affected her ability to drive due to the pain and restriction in turning her head.

Methods/Intervention:

Evaluation of patient's cervical range of motion was found to be reduced by 30 % of normal and radiographic analysis revealed moderate degenerative joint disease in the lower cervical spine from C4-C6 . Palpation of the cervical spine musculature and associated soft tissue found marked fascial restriction, rigidity. There was pain upon palpation (as reported by the patient). Range of motion [10-12] and myofascial palpation for pain [13-15] have both been found to have some reliability and validity.

Treatment consisted of cervical traction utilizing the Pronex Cervical Traction. This is a hand controlled pneumatic traction device which does not apply any pressure or tension to the chin or mandible. The cervical traction was applied for 10-15 minutes immediately before the treatment of the cervical spine and the TMJ. The patient's head was placed in the traction unit in the supine position and the doctor pumped the sphygmomanometer bulb until the patient felt a mild distractive pressure in the cervical spine. Then the patient was given the sphygmomanometer bulb to pump when she felt her muscles had relaxed and no cervical traction was felt. When there was no traction felt by the patient, the patient then gave the bulb 2-3 more pumps until she felt some traction and then continued to relax in that position. Following 15 minutes of care the patient was then treated with SOT procedures; particularly cervical stairstep correction [16] and cranial therapeutic techniques for the TMJ [17].

Results:

It was significant that the patient allowed her neck muscles and cervical spine to be manipulated and treated following the cervical traction. She had not at allowed this manipulation in approximately 10 years. Following treatment the patient had a marked increase in cervical range of motion (reached normal levels) and a 90% decrease in pain and tension on palpation. Immediately following traction the patient could relax and the cervical spine manipulation and the associated soft tissue were much less resistant and more responsive to treatment, which was believed to increase the effectiveness of the interventions. While the patient did have relief from the care rendered, the cervical manipulation was performed with very low force and no residual pain to the patient. The

ability to treat the cervical spine also appeared to aid in her post-treatment decrease in TMJ related tension and pain.

Discussion:

Since the advent of chiropractic and dental co-treatment of TMJ disorders, it is not uncommon for patients with TMJ pain or dental co-treatment to be seen by chiropractors [18-23]. As demonstrated with this case, there is a value of being able to perform cervical traction without creating any adverse tension or pressure to the TMJ, dental occlusion, and related soft tissues.

Multidisciplinary models of care for various types of conditions appear to be the wave of the future for the treatment of complex patient presentations and treatment of TMJ and cervical related dysfunction. This represents one such opportunity [24]. Ascending and descending issues can contribute to a patient's symptom presentation. This suggests that TMJ dysfunction may contribute to cervical spine pain and cervical spine pain may contribute to TMJ pain or disorders. In one chiropractic study, Vernon and Ehrenfeld concluded that cervical spine pain "may be interrelated with temporomandibular joint syndrome due to malocclusion and that when such cervical spine pain is not satisfactorily responsive to routine chiropractic care, dental examination may be indicated [25]."

On the other hand, dental studies have reported that malocclusion, TM condylar position, and airway dysfunction all can have an effect on cervical spine and head position [26-8]. Yet in clinical circles we are commonly left with the situation that the body is a closed kinematic chain with relationships between psychosocial, biomechanical, myofascial, neurological, ergonomic, and a multitude of other integrating factors. For this reason it is not unexpected that the research has found that posture and dental occlusion [29] and the neck and TMJ [30] are closely integrated. Essentially, stress to one joint will commonly affect the other one. Therefore to be able to effectively apply a therapeutic approach to either joint without exacerbating or creating an adverse reaction would be preferred.

While this case was dramatic to the patient, chiropractor, and dentist, it is very difficult to generalize these results without further study. Limitations to the study included are similar to most case reports in that there were no control subjects or comparative sham procedures. Future studies could incorporate objective assessment tools and other forms of cervical traction, which may or may not have pressure to the jaw or chin. These greater studies could help rule out confounders such as the placebo effect, regression to the mean, and ideomotor effect. Of significance is that prior to the cervical traction and SOT cervicocranial treatment, the patient did not allow chiropractic treatment of the cervical spine for the past 10 years. Also of significance is the temporal relationship between the treatment rendered and her immediate increase of motion and decrease of pain.

Conclusion:

The purpose of this case was to explore the efficacy of using cervical traction without pressure to the jaw to support chiropractic treatment as well as to facilitate a patient's ability to receive care for neck and jaw pain and stiffness. The value may be what might be the long term effect of the traction, if preformed as a daily treatment as a home therapy. Greater study needs to be performed to evaluate whether the findings in this study could lead to larger group studies with controls. While the face validity of creating pressure upon the jaw with cervical traction would be expected to have an adverse effect, further comparison studies are needed to come to a definitive conclusion. Further research is needed to determine if patients that need cervical traction, yet have some TMJ dysfunction, represent a specific subset of patients that require this novel form of cervical traction.

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The alterations of the dyspeptic signs and symptoms of patients with gastritis following chiropractic treatment: A small randomized controlled study.

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Introduction:

Gastritis is an inflammation of the lining of the stomach, and has [pw26]many possible causes [1]. The main acute causes are excessive alcohol consumption or prolonged use of nonsteroidal anti-inflammatory drugs (NSAIDs). Sometimes gastritis develops after major surgery, traumatic injury, burns, or severe infections. Gastritis may also occur in those who have had weight loss surgery resulting in the banding [pw27]or reconstruction of the digestive tract. Chronic causes are infection with bacteria, primarily Helicobacter pylori, [pw28]chronic bile reflux, stress and certain autoimmune disorders can cause gastritis as well. The most common symptom is abdominal upset or pain. Chronic acute gastritis (CAG) is relatively common among older adults in different parts of the world, but large variations exist [2].

Dyspepsia refers to a condition of impaired digestion characterized by chronic or recurrent pain in the upper abdomen, upper abdominal fullness and feeling full earlier than expected when eating. Dyspepsia is a common problem and is frequently due to gastroesophageal reflux disease (GERD) or gastritis.

Basically, [pw29]typical allopathic care for gastritis consists of diets and use of medicines, however[pw30] interest in alternative non-pharmaceutical methods has been increasing in recent years. Commonly, while patients look to the chiropractic for relief of musculoskeletal complaints, some studies have found patients seeking chiropractic care for nonmusculoskeletal complaints [3][pw31]. There have been studies investigating patients reporting non-musculoskeletal conditions improved unexpectingly following chiropractic care [4-7] and chiropractic care for nonmusculoskeletal conditions has been developing some biological plausibility.[pw32]

A survey of Australian chiropractors found that dyspepsia is a commonly reported "symptom encountered in chiropractic clinics. Thoracic adjustments (mostly T5-T8), nutritional advice and cervical adjustments (mostly C1) were the 3 most common methods of management used [8]." Young et al in a British study found that "patients with chronic idiopathic dyspepsia may benefit from conservative chiropractic management in terms of decreased symptom frequency and severity over a 3-month period and dependence on palliative pharmacological interventions [9]."

The purpose of this study was to investigate whether chiropractic care, specifically sacro occipital technique (SOT) chiropractic manipulative reflex technique (CMRT) for the upper gastrointestinal system could be an effective method of care for patients presenting with dyspetic signs or gastritis. This study received institutional review board approval by Feevale University on September 21, 2009.

Methods:

The objective of this study was to document if alterations of the dyspeptic signs and symptoms could be determined with patients medically disagnosed with gastritis following a specific chiropractic treatment. The sample was composed of fifteen subjects, medically [pw33]diagnosed with gastritis by an endoscopic examination along with accompanying clinical symptoms. [pw34]

The 15 subjects were randomly divided into three groups of five: one group was the control [pw35]which received no treatment, one group was[pw36] treated with traditional pharmaceutical interventions, and one group was[pw37] treated with chiropractic. The study was monitored by a medical specialist in gastroenterology to protect the subjects in case there was an emergency [pw38]worsening of their condition. If a patient's condition worsened then that [pw39]subject would be [pw40]removed from the study and appropriately treated.

The chiropractic treatment was carried through [pw41]in four consultations applying vertebrals[pw42] adjustments and the sacro occipital technique (SOT) chiropractic manipulative reflex technique (CMRT) protocol for gastric syndrome. Endoscopy[pw43] evaluation was performed before and after the chiropractic treatment to determine if there were any alterations to the stomach tissue as well as subjective signs of gastritis[pw44]. In addition a clinical outcome assessment questionnaire was used to verify any changes in a subject's clinical symptoms.

Results:

Results were gathered utilzing the endoscopy findings obtained by the medical specialist and the SF-36 questionnaire to assess changes in a subjects quality of life.
Before and after endoscopic examinations were performed on all 15 cases in this study by the allopathic gastroenterologist. The gastroenterologist performed a report for each case and the results were that[pw45]: (1) The control group had slight improvement of endoscopic gastritis signs and had worse pain after 1 month; (2) The group that received traditional pharmacological treatment had no clinical significant diferences[pw46] in endoscopic gastritis signs, comparing [pw47]the before and after endoscopic report, and their quality of life was the same after the treatment, [pw48]with persistant stomach discomfort; and (3) The chiropractic group had a clinically significant decrease in endoscopic gastritis signs compared to before and after [pw49]endoscopic results as well as a significant improvement in their quality of life.
A confounder in this study was that the control or untreated group decided to self treat [pw50]with nutritional supplementation when they found out [pw51]they had gastritis and realized they were not going to be treated with medication or chiropractic care. Therefore [pw52]the "control group" was more a comparison group since the nutritional supplementations appeared to faciliate some reduced endoscopic signs of gastrits. While the control group had some decrease of endoscopic gastritis signs, compared [pw53]with

traditional pharmacological treatment and control group, the chiropractic group had the greatest positive clinical response with improved endoscopic and quality of life findings.

Discussion:

Pickar notes that the physiological effect of the manipulation of the vertebral column may be causing [pw54]mechanical stimulations to the thoracic region which can affect sympathetic nervous system activity, possibly inhibiting the gastric motility [9,10]. Results of international studies have shown that the chiropractic treatment can improve visceral conditions, provoking questions for the use of spinal manipulative care for patients with non-musculoskeltal conditions [3-7], such as gastrointestinal disorders (e.g., gastritis, dyspepsia, etc.) .

A pilot study presented in 2010 [11] investigated chiropractic treatment of GERD with a sample composed of 10 individuals sent for chiropractic treatment by a gastroenterologist surgeon. High digestive endoscopy exam[pw55] were performed on all individuals before and after 8 [pw56]sessions of SOT CMRT chiropractic treatment specific for gastric syndrome. A GERD symptom's [pw57]questionnaire and the results from high digestive endoscopy exams were used to evaluate dyspeptic signs and symptoms. Following the conclusion of chiropractic treatment a[pw58] statistically significant global reduction of GERD symptoms was observed (p=0.0002) especially [pw59]on the evaluation of pre and post treatment [pw60]postprandial pyrosis data (p=0.000004). Through endoscopic examinations on the 10 patients[pw61] the findings noted a 58% improvement of esophagitis caused by GERD [11].

Conclusion:

In this study it was concluded that following chiropractic treatment (CMRT) and after analyzed the before and after endoscopy studies, the subjects of the group treated with chiropractic had a significant improvement in the alterations of the signs and symptoms of the gastritis. [pw62] While there was some improvement in the control group it was not on the magnitude of what was seen with the chiropractic treatment group. Further research with large study samples are needed to determine if there is a subset of patients with gastritis or dyspepsia that may respond to CMRT care and mitigate the need for medications or more invasive procedures that offer risk. With treatment of non-musculoskeltal conditions it may be important for the chiropractor to work closely with allopathic healthcare practitioners to carefully monitor patient symptoms and progress.

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SOT: Category Three: Predictability of outcomes: A case series.
Harvey Getzoff, DC

Introduction:

Patient pain patterns and spinal patterns in conjunction with Sacro Occipital Technique (SOT) Step Out Toe Out maneuver (SOTO) and the Straight Leg Raise (SLR) can be helpful in making accurate judgments regarding the severity and the prognosis of the condition, as well as establishing and communicating an effective treatment plan.

Straight Leg Test:

The SLR, also called Lasègue test, can be performed during the physical examination to determine whether a patient with low back pain has an underlying herniated disk, mostly located at L5 /S1 level. A systematic review of the literature including statistical meta-analysis noted that the SLR test has had its diagnostic accuracy limited by its low specificity [1]. Yet other studies have found that that the SLR can be useful. Jönsson and Strömqvist found that the SLR as performed in clinical practice has a strong correlation with various parameters that signify the pain level of the patient [2]. Summers et al noted that "acute low back pain associated with significant restriction in SLR is likely to be caused by a disc prolapse compressing the anterior theca [3]."

A study by Xin et al of 113 patients "showed a close relationship between the location of the pain and the position of the protrusion of the disc. The degree of limitation of SLR was also found to have a direct relationship to the size and position of the protrusion and to its relationship to the spinal nerve. The protrusions were classified into three types according to position in relation to the dura mater and to the pattern of pain that was induced by passive SLR. On SLR, central protrusions tended to cause pain in the back, lateral protrusions caused pain in both the back and lower extremity.On this basis, the distribution of pain on SLR allowed an accurate prediction of the location of the lesion in 100 (88.5 per cent) of the 113 patients [4]."

Step Out Turn Out Maneuver

The SOTO maneuver is utilized in SOT both diagnostically and therapeutically in the treatment of disc herniations [5,6]. A study by Remeta "evaluated a five case review from patient records where positive SOTO maneuver findings were correlated to MRI results [7]." The SOTO maneuver was performed on patients with lower extremity radiating pain. The patient was prone and the affected leg was then abducted, the leg externally rotated and foot dorsiflexed. This position is held for 30 seconds and then placed in the neutral position for one minute and then repeated. The patient's report of the change in pain intensity (same, better or worse) determined the indicated findings

"The SOTO maneuver is purported to help differentiate between lumbar disc lesions from a piriformis muscle syndrome. Additionally the SOTO maneuver is also used to assist diagnosis into the type and severity of the disc lesion. Positive SOTO maneuver findings for piriformis muscle syndrome is determined by elimination of the radiating pain after the first time the maneuver is performed. Disc findings, on the other hand, were associated with reports of no change or worsening of the patient's symptomatology, after the first maneuver. For these patients the maneuver was performed two additional times at one-minute intervals. Findings of 'same, same, better' or 'same, better, better' offered a good prognosis following SOT category three chiropractic conservative care [7]."

"Findings of increased pain on second and third attempts of the maneuver was indicative of disc fragmentation and high probability necessitating surgical intervention. A clinical study was performed to test the diagnostic accuracy of the SOTO maneuver in patients with lumbar disc lesions. The study was accomplished by comparing initial examination SOTO indicators and results of MRI. A high degree of accuracy was observed in being able to differentiate a disc bulge versus disc herniation via the SOTO Maneuver, as supported by MRI. Therefore the five cases studied where positive disc finding were indicated by the SOTO maneuver followed by MRI, offered consistent findings for segregating disc fragmentation from disc protrusion and prolapsed [7]."

SOT: A Systems Method of Analysis

The scenarios that follow depict three different patient outcomes. There are case studies of each of the scenarios regarding basic history, key findings and commentary concerning the outcome of each case. SOT is a method of chiropractic based primarily on the identification and treatment of three bodily systems (called Categories): The cranial-sacral respiratory system, the weight-bearing system and the function of the lumbar spine. SOT was developed by Dr. M. B. DeJarnette, an osteopath and chiropractor [8]. Utilizing SOT evaluation procedures and incorporating standard orthopedic testing can help guide successful treatment and predictable outcomes. Keep in mind that some case scenarios will have overlapping findings but still can be judged for the predictability of its outcome.

Scenario # 1 Presentation:

Scenario # 1 has a spinal lean with possible lumbosacral pain along with pain in the buttocks and the upper leg on the OPPOSITE SIDE OF THE LEAN. The pain could or could not be duplicated with the SOTO maneuver; however, if painful, each SOTO will lessen the pain.

A Heel Toe Test [9] (standing and walking on the toes then on the heels) should be easily achieved without provoking pain. The patient's pain should not be exacerbated while sleeping. A SLR will have limitations bilaterally or unilaterally with possible pain on the

involved side. The prognosis is positive. The diagnosis is a bulging disc. The predictability of recovery is favorable.

Findings:	**Remarks:**
Pain Pattern	Opposite side of the spinal lean
SOTO	No pain, probable unilateral restriction
Heel/Toe Test	Able to do, no pain
Spinal pattern	Lean to side opposite the pain
Sleeping	No night pain
SLR	Bilateral or unilateral restrictions

Case Study Scenario #1

Basic History: Female, Mary C., born 2/29/1940. Right low back pain in lumbosacral area and pain in right lower buttocks. Onset, four months previous. No trauma. X-ray diagnosis: spinal stenosis.

Key Findings: Category III. Left spinal lean. Straight leg raise, right 75 degrees, left psoas. No Heel Toe finding. Right SOTO restriction.

Commentary: Presently out of pain, maintaining homecare and exercise. Still has left lean, SOTO improved, SLR bilateral 90 degrees.

Scenario # 2 Presentation:

If the findings become more like scenario #2, the prognosis will be more guarded, the severity of the condition is greater and the treatment plan is more conditional. Patient participation becomes more important.

Scenario #2 has possible spinal pain with pain of the entire leg on the SAME SIDE OF THE LEAN. Pain is often elicited with the SOTO maneuver. More repetitions may be needed for improvement, or it is possible that no improvement will be seen using SOTO. The Heel Toe Test should still be negative for lower leg neuromuscular deficiency and pain. The patient still should be able to sleep through the night without being awakened by leg pain. The SLR is also limited especially on the involved side. As previously stated, the prognosis is guarded; however, the probability of recovery is still possible. The treatment plan must be regulated for maximum patient support (rest, exercise and an understanding of the severity of the problem.)

Findings:	**Remarks:**
Pain Pattern	Same side as lean on entire leg
SOTO	Possible pain with possible improvement
SLR	Limited bilateral
Sleeping	Able to sleep without pain
Heel Toe Test	Able to do with no pain.

Spinal Pattern	Lean to same side as leg pain

Case Study Scenario #2

Basic History: Male, Louis S., born 11/25/1961. Low back pain, left and lumbosacral area. Left leg pain, posterior, buttocks and leg into ankle, chronic history. Recent episode three weeks ago. Able to sleep through the night.

Key Findings: Left spinal lean, left SOTO, slight posterior pelvic pain and restriction. No Heel Toe finding, straight leg raise, right 70 degrees, left 60 degrees with slight discomfort in left buttocks area.

Commentary: Out of leg pain, some lumbosacral pain, bilateral 85 degrees SLR. Some left SOTO restriction. No lean. Continuing homecare.

Scenario # 3 Presentation:

If the findings become more like scenario #3, the prognosis is even more guarded, the severity of the condition is even greater and the treatment plan acceptance by the patient is with an understanding of the possibility of not having a fully successful outcome.

Scenario #3 can have no spinal lean or curvature with no lower back, buttock or upper leg pain. The pain is severe in the calf and possibly the foot, and there is difficulty sleeping because of the pain. There will be no pain on SOTO. SLR will have bilateral restriction with significantly more restriction in addition to pain on the involved side. There will be a positive Heel Toe Test finding for pain and limitation on the involved side. As mentioned, the prognosis is poor; a MRI will further define the problem and usually medical intervention will be needed. Scenario #2 and #3 are more likely to have disc herniations, scenario #3 obviously more severe.

Findings:	**Remarks:**
Pain Pattern	Severe in one calf
SOTO	No pain
SLR	Limited and painful on involvement side
Sleeping	Unable to sleep through the night
Heel Toe Test	Limitation on side of involvement
Spinal Patter	Worse if lean to same side as calf pain but opposite side lean still a guarded prognosis.

Case Study Scenario #3:

Basic History; Female, Lynn G., born 1/11/1975. Pain left sacroiliac region and posterior left buttocks and leg into foot, most severe in left calf. Unable to sleep due to

pain in left calf. One month duration, progressively getting worse, especially the last three days. Taking up to 1800 mg. Ibuprofen per day. Painful when coughing.

Key Findings: Difficult walking on heel and toes of left foot. Left spinal lean, SOTO negative. Palpatory tenderness, lumbar 4,5 and lumbar 5, sacral spinous spaces. SLR left 30 degrees and painful in calf.

Commentary: Improvement of calf pain. Pain when doing lumbar flexion exercising. Limited adjustments due to personal problems. Pain remains in low back and vague in left leg. No longer left lean. Heel Toe finding improved. Sleeps better. SLR 60 degrees positive on left, normal on right.

Treatment:

SOT category three procedures [10-3] can be extremely effective in treating all three scenarios, especially if DeJarnette's Sitting Disc Technique (SDT) [6,14] is incorporated along with the category three adjusting protocol. Also the SOTO maneuver is both a diagnostic test and an adjustment. Subsequent SOTO applications on the blocks further define the problem while at the same time may often improve the patient's presenting condition. The SLR can be instantly retested in all three scenarios immediately after the SDT and show a marked improvement.

Discussion:

All three scenarios should be examined repeatedly at each office visit utilizing a plumb line for weight bearing gravitational analysis. As the antalgic lean lessens- and it often does - this alone can be significant for judging patient improvement. SOT category three treatment and analysis offers a unique skill set for doctors who treat patients who prefer not to have forceful thrusting to the spine or, due to their condition, (e.g., post fracture, osteoporosis, etc.) may have contraindications to this form of care.

One crucial ingredient when it comes to the predictability of all the scenarios presented in this article is the patients are seventy years of age or older, with possible compression fractures in the lumbar and/or transitional areas of the spine. This is of particular importance in female patients. Acute compression fractures are extremely difficult to adjust and have a limited positive outcome (guarded at best). By following these protocols, patients with old compression fractures of the spine can be more manageable with a better predictable outcome based on these three scenario guidelines.

Utilizing case studies to evaluate real clinical experiences [15] can be extremely valuable for doctors. It can be used to understand how a doctor with over 30 years' experience uses patient assessment as an important piece in the "clinical experience" aspect of building an evidence-informed practice. The study design was observational with no control or comparison group. Thus, changes of the patients' conditions may have been the

result of a natural progression of the condition, placebo effects, ideomotor effect, Hawthorne effects, or confounding variables. It must be emphasized that the patients were not all treated in the same way because this was a pragmatic case study.

Conclusions:

While there is a great need for randomized controlled trials (RCTs) to help evaluate the utility of assessment and treatment modalities, this type of study does tend to limit the actual clinical encounter which occurs in a doctor's office. This reductionist quality of RCTs makes incorporating pragmatic, observational type study of value in the development of an evidenced informed practice. More observational pragmatic case studies that can yield predictable outcomes should be presented as a means to incorporating evidence and clinical experience into clinical practice.

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SOT procedures, case studies, and standard orthopedic testing: A case series,
Harvey Getzoff, DC

Introduction

The majority of patients (approximately 85%) presenting with low back pain have their back pain classified as non-specific [1]. "Although most spinal conditions are benign and self-limiting, the real challenge to the clinician is to distinguish serious spinal pathology or nerve-root pain from non-specific neck and low-back pain. The use of valid procedures can assist the clinician in this aim [2]."

Orthopedic and neurological tests are commonly used with chiropractic diagnostic methods to evaluate patients with chronic mechanical low-back pain. Studies have found these tests are not readily reproducible [3]. Essentially "most procedures commonly used by clinicians in the examination of patients with back pain demonstrate low reliability [4]."

The purpose of this article is to illustrate clinical differences between sacro occipital technique (SOT) evaluating procedures and standard orthopedic testing. Used within the SOT clinical experience, SOT's arm fossa test and the Step Out Toe Out (SOTO) maneuver can offer more specificity and predictability than standard orthopedic testing. These two SOT tests (described in detail in the discussion section) can help focus treatment for site and severity of lesions, as well as dictate specific adjusting procedures designed to address their findings [5-7].

These case studies utilize the arm fossa test and SOTO maneuver to help direct chiropractic care [5-7]. Following the case studies, eight standard and popular orthopedic tests will be listed with comment on their relevance for evaluating lower back conditions and relationship to the arm fossa test or SOTO maneuver.

The Arm Fossa Test:

The term used to denote the response of the arm when placed in a specific position and pulled on command while placing instantaneous pressure on specific areas of the inguinal ligament. This ligament's receptor system responds to sacroiliac disturbances; therefore, this test is indicative of the stability of the weight-bearing sacroiliac joint. The arm fossa test relates to sacroiliac sprains and category II adjusting procedures [5-7].

Case Study Utilizing the Arm Fossa Test:

Basic History: Patient VM. (DOB 4/21/1950), presented with neck pain posterior and lateral, three months duration, especially when lifting head and bringing head forward and head and jaw generalized pain. CT scan and spinal tap were negative. Medication are Advil, a nasal spray and Musinex.

Key Findings: Right leg deficiency, left lower arm fossa test positive. Cervical ranges of motion sitting; right rotation 60 degrees, left lateral flexion 50 degrees, forward flexion 40 degrees. The primary cranial finding is the right maxillary malar suture.

Commentary: The arm fossa test and the supine leg deficiency were normal after the third adjustment. The cervical range of motion improved 50 percent and stabilized. The patient reported no further need for the medications, with no head pain and less cervical discomfort. (Note: the Arm fossa test identified an active Category II, even though sacroiliac pain was not reported.)

Step Out Toe Out: This procedure is the abduction and external rotation of the leg in a prone position to test acetabular mechanics, the piriformis muscle and sciatic nerve responses as related to disc tissue. Repeated application of this maneuver can further define the serious nature of the problem. SOTO serves as an indicator for category III adjusting procedures that address sciatica, piriformis muscle syndrome, and discopathy [5-7].

Case Study Utilizing the Step Out Toe Out Procedure:

Basic History: Patient DS (DOB 9/24/1937), presented with pain at the left sacroiliac joint, posterior upper thigh, anterior lower thigh, and lower leg and foot. Patient DS was able to sleep only with medication. The patient stated that the onset was two and a half years prior and physical therapy and epidurals were not helpful. The patient utilizes a cane.

Key Findings: Left lateral spinal curve/lean, left iliofemoral restrictions with left SOTO restriction and pain, limited interspinous space at lumbar 4/5 + , posterior lumbar 1, left straight leg raise 30 degrees provoking lumbar pain, right straight leg raise 40 degrees also provoking lumbar pain.

Commentary: The SOTO maneuver became less painful with each application along with improved movement. The SOTO maneuver became less relevant with each subsequent visit. The Sitting Disc Technique improved the straight leg test both immediately and from visit to visit. Pain reduction steadily improved and the patient no longer felt the need for her cane.

Standard Orthopedic Tests:

Various standard orthopedic or neurological tests are commonly used in diagnosis of low back pain. Of the following eight orthopedic tests "the straight-leg raise is the only sign consistently reported to be sensitive for sciatica due to disc herniation, but is limited by its low specificity. The diagnostic accuracy of other neurological signs and tests is unclear [2]." Chiropractors and other professionals who use manual therapy perform

additional physical examinations to develop greater specificity and help determine whether dysfunctional joints are apparent that can account for low back symptoms [8].

The majority of the chiropractic tests for lower back pain have not been studied sufficiently or evaluated in relation to reliability and validity. Of the tests reviewed by Hestbaek and Leboeuf-Yde, only tests for palpation for pain had consistently acceptable results. "Motion palpation of the lumbar spine might be valid but showed poor reliability, whereas motion palpation of the sacroiliac joints seemed to be slightly reliable but was not shown to be valid. Measures of leg-length inequality seemed to correlate with radiographic measurements but consensus on method and interpretation is lacking. For the sacro occipital technique, some evidence favors the validity of the arm-fossa test but the rest of the test regimen remains poorly documented [8]." "Palpation for muscle tension, palpation for misalignment, and visual inspection were either undocumented, unreliable, or not valid [8]."

Therefore, of the various types of chiropractic tests for low back pain, the palpation for pain and the arm fossa test had some degree of validity. If the orthopedic and neurological tests have limitations commensurate with the chiropractic tests, how can we reach a predictable diagnosis to guide treatment? One option commonly used is the combining of various assessment tools, such as evaluating range of motion, orthopedic, neurological, chiropractic testing and radiographic analysis. With the non-specific nature of most orthopedic and neurologic tests, the SOT arm fossa test and SOTO maneuver can help determine greater specificity to direct therapeutic application.

Eight Commonly Used Orthopedic and Neurologic Tests

The Trendelenberg Test: The standing patient flexes their leg at the knee to the level of the hip on the uninvolved side. If the iliac crest lowers the test is positive for a variety of hip pathologies [9,10].
Comment: *Most patients have primary and secondary hip (acetabular joint) dysfunctional problems which can be identified utilizing standard SOT procedures inclusive of the SOTO procedures. SOTO also can identify hip joint pathologies.*

Kemps Sign: The seated patient bends obliquely backwards, if pain radiates down the side the test is positive for a variety of possibilities in various areas [10,11].
Comment: T*he arm fossa test identifies sacroiliac problems while the SOTO identifies lumbo pelvic problems. Both of these tests can help increase examination specificity.*

Minors Sign: The seated patient places one hand on their healthy leg and one hand on their back as they rise from a seated position. This test is positive if pain is elicited for various problems from a sacroiliac problem to a lumbar disc syndrome [10].
Comment: *A proper history can help locate pain and the nature of the pain.*

Goldthwaits Test: The examiner places one hand under the supine patient's lower spine. The patient raises their leg on the involved side toward the abdomen without allowing the knee to flex. This test is positive if pain occurs before the spine moves for a range of problems, one being generalized disc involvement [10].
Comment: *This test can be helpful even though it lacks specificity and the SOTO can help with differentiating the exact nature of the disc lesion. Goldthwaits Test can be good to incorporate with an SOT examination along with the Straight Leg Raise.*

Braggards Test: The same as the Straight Leg and Goldthwaits Test except that the examiner's hand dorsiflexes the patient's foot instead of palpating the spine. This test can be effective in analyzing the severity of a disc lesion [12]. **Comment**: *The SOTO also can utilize dorsiflexion to further specify the causal factor in sciatic nerve pain.*

Patrick Faber Test: The examiner flexes the supine patient's thigh then abducts and externally rotates the thigh, then places the external malleolus over the opposite knee pressing downward. Then the examiner extends the patient's leg. This test is positive if the patient is unable to perform these motions or pain occurs [10].
Comment: *This test is effective for identifying hip joint lesions and can be incorporated with the SOT Iliofemoral (hip internal rotation testing) tests and the SOTO maneuver to help evaluate piriformis muscle type syndromes.*

Gaenslens Test: The supine patient is placed to the side of the table with one leg flexed upon the abdomen. The opposite leg is lying off the table. The examiner places pressure upon the flexed leg and hyperextends the opposite thigh. This test is positive if pain occurs in the sacroiliac for a sacroiliac lesion [10].
Comment: *SOT's arm fossa Test can also help diagnose a sacroiliac lesion, without the patient reporting pain, while directing you into a method of care (category II adjusting). Therefore the arm fossa test can also be utilized without pain provocation and be a functional assessment tool for sacroiliac instability.*

Heel Toe Test (Neurological): The patient stands on their heels and walks, then walks on their toes. This test is positive if the patient is incapable of doing either of these actions on one leg relative to the other. Inability of heel walk relates to L4/5 and inability of toe walk relates to L5/S1 [13].
Comment: *This test can help confirm neuromuscular weaknesses found in severe disc lesions, identified by the SOTO procedure and can be incorporated to help with specificity of diagnosis and treatment.*

Discussion:

There has not been extensive study of the SOTO maneuver and only limited study of the arm fossa test, yet there has been some significant clinical research that discusses their use and clinical significance. SOT practitioners have used the arm fossa test for 4 decades to evaluate posterior SI joint laxity and pelvic torsion. The reliability and validity of the arm fossa test was discussed by Hestœk L, Leboeuf-Yde [10], and "results

from the different reliability studies varied widely with some evidence favoring the validity of the arm-fossa test ... [10]" "Two intraexaminer reliability studies of sacrooccipital technique tests both scored greater than 80% (88% and 100%). One examined the arm- fossa test and demonstrated excellent agreement, whereas the other examined a variety of tests with good results for one examiner and poor for the other [10]." "Two studies were found of the validity of the arm-fossa test (80% and 90%), both demonstrating some validity of the method [10]."

Purportedly the arm fossa test can evaluate various levels of SI dysfunction including joint laxity affecting joint form closure and the SI joint's ability to sustain sufficient supportive capacity [14]. The arm fossa test incorporates: (1) The relationship between SI joint imbalances associated with secondary inguinal ligament (lowered threshold) sensitivity, (2) The testing of an arm muscle which is simultaneously causing the lumbodorsal fascia to tense, and (3) The patient's ability to respond, without a delay, when inguinal ligament and lumbodorsal fascia are challenged. These characteristics make the arm fossa test quite sensitive so that SI dysfunction might be found sub-clinically, particularly when there is force closure dysfunction secondary to joint hypermobility, pelvic torsion, and joint dysrelationship [14].

Category two supine block placement facilitates both form and force closure of the SI joint by reducing pelvic torsion and compressing the posterior SI joint. The compression helps reduce the secondary swelling in the joint capsule allowing the joints to come into better juxtaposition. Theoretically the reduction of ligament laxity reduces proprioceptive excitation and therefore has a positive neuromuscular effect. This positive neuromuscular response affecting the sacroiliac joint allows the arm fossa test to function as a pre and post assessment tool to evaluate needs for the placement of the pelvic blocks and when they should be removed [15,16].

The SOTO maneuver can be utilized in SOT both diagnostically and therapeutically in the treatment of disc herniations [17,18]. A study by Remeta "evaluated a five case review from patient records where positive SOTO maneuver findings were correlated to MRI results [19]." The SOTO maneuver was performed on patients with lower extremity radiating pain. The patient was prone and the affected leg was then abducted, the leg externally rotated and foot dorsiflexed. This position is held for 30 seconds and then placed in the neutral position for one minute and then repeated. The patient's report of the change in pain intensity (same, better or worse) determined the indicated findings.

"The SOTO maneuver is purported to help differentiate between lumbar disc lesions from piriformis muscle syndrome. Additionally the SOTO maneuver is also used to assist diagnosis into the type and severity of the disc lesion. Positive SOTO maneuver findings for piriformis muscle syndrome is determined by elimination of the radiating pain after the first time the maneuver is performed. Disc findings, on the other hand, were associated with reports of no change or worsening of the patient's symptomatology, after the first maneuver. For these patients the maneuver was performed two additional times at one-minute intervals. Findings of 'same, same, better' or 'same, better, better' offered a good prognosis following SOT Category Three chiropractic conservative care [19]."

"Findings of increased pain on second and third attempts of the maneuver was indicative of disc fragmentation and high probability necessitating surgical intervention. A clinical study was performed to test the diagnostic accuracy of the SOTO maneuver in patients with lumbar disc lesions. The study was accomplished by comparing initial examination SOTO indicators and results of MRI. A high degree of accuracy was observed in being able to differentiate a disc bulge versus disc herniation via the SOTO Maneuver, as supported by MRI. Therefore the five cases studied, where positive disc finding were indicated by the SOTO maneuver followed by MRI, offered consistent findings for segregating disc fragmentation from disc protrusion and prolapse [19]."

Utilizing standard orthopedic testing tends to offer a non-specific diagnosis whereas the arm fossa test and SOTO maneuver can be used to develop greater specificity and diagnosis for treatment of low back pain syndromes. Having tests that can be used before, during, and post treatment can help develop tests for better outcomes and improve predictability of what care should be rendered.

Conclusion:

This paper presented a general overview of orthopedic testing and theorizes how SOT's arm fossa test can help diagnose treatment for the sacroiliac joint and the SOTO maneuver can help differentially diagnose lumbo pelvic problems, disc lesions and the degree of disc damage. These SOT tests are primarily based on body responses and a patient's sensitivity to pain which can facilitate specific category adjusting procedures and can become predictable outcome assessment tools. Further research into studying reliability and validity of the arm fossa test and SOTO maneuver should be performed, as well as evaluation of how they can be incorporated with various orthopedic and neurological tests.

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One cause, one cure, one equation: Enteric structural mechanics and enteric axial harmonics: A case report.

Laura Hopkins, EC, Jim Countryman DC

Introduction

The opportunity to create an engineering platform for patient care and provide a business opportunity to redefine the Enteric Nervous System (ENS) for the healthcare sector was established at the Hopkins Bioengineering Research Center (HBRC) in 2009 with a grant from the State of Iowa's Department of Education. This establishment serves as a systemic repair to the healthcare system and will educate government, academia, and the public to create engineering tools for practitioners in clinical application.

Enteric Structural Mechanics (ESM) and Enteric Axial Harmonics (EAH) are new inventions in chemical engineering that will provide the healthcare system with: 1) a greater understanding of how the human body operates individually and as a component within a family and community network, 2) greater confidence and less risk in patient analysis, diagnosis and treatment and, 3) standardization for conditions currently considered outside the chiropractic scope for third party consideration.

ESM and EAH analyze, diagnose, and treat based upon the enteric nervous system (ENS) as it is redefined for chemical engineering (ChE). Through this invention, the chiropractor can be freed from relying solely on indicators per patient visit and move to quantifying patient care as minimizing enteric turbulence.

Chiropractic's Sacro Occipital Technique (SOT) clinically appears to provide an effective frame of reference for ESM and EAH for multi-platform concurrent clinical application of chiropractic and engineering techniques. The purpose of this article is to illustrate the potential for new market share opportunities combining chiropractic and engineering treatment. Chronic, severe, and complex, this case study provides an excellent example of the benefits of engineering in the clinical application of chiropractic.

Case History

The patient, a 41 year old female presents to Palmer Chiropractic College for care. Reviewing the Integrated Patient Summary, the patient's problems are listed as: temporomandibular pain on the right with date of onset as 5 weeks prior; difficulty concentrating with a date of onset 4.5 years prior, and hamstring pain with a date of onset 13 weeks prior. Reviewing the Past Health, Family and Social History, she had never visited a chiropractor. She was taking fish oil and multivitamins. She listed allergies, chicken pox, anemia, depression, and psychiatric problems as historical issues. She listed

a cardiac arrest and a surgery in June of 1997. Her body had conceived 6 times with 2 live births, one with Mosaic Turner's Syndrome. She reported irregular menstruation, anxiety, behavioral changes, confusion, and memory loss. She had recently had a tooth pulled that was causing her significant pain. This summarizes the presentation in the file based upon her responses to questions on the institution's health forms.

To complete the picture: as a teenager, this patient became anorexic and bulemic. Losing most of her body fat, she still, at 41 is significantly underweight. At approximately 20 years of age, she became an alcoholic. She spent many years as a "closet alcoholic" and drank as much as 1 liter of vodka a day. When her heart stopped, her son was 21 months old and she was 4 weeks pregnant with her 4th conception. Her father was physically abused by his father. Her husband was abused physically and sexually by his father. Once her first child was born, her husband became agressive and abusive which further increased her alcohol consumption. An "ugly" divorce followed years later. The patient is extremely close to her mother, the patient's father's death 6 months prior led her to the alcohol/seizure pattern once more. Upon being introduced to this case, the author requested concurrent chiropractic care and referred her to an SOT chiropractor.

Interventions/Methods:

At the end of his book [1], Thomas W. Myers discusses "maturational development" with two pictures. He presents a male and female with the following statements.

> Can you see the underlying very small boy within the postural patterns of the middle aged man [in the male's photograph]?. Can you see that the pelvis of the young woman ... looks 'younger' than the rest of her structure? Are such observations clinically useful? Sometimes observed with sexual trauma... We have stepped over the line from remediation of biomechanical inefficiency toward the realm of the somatic psychologist... In our opinion, being able to recognize such restrictions, parse out the underlying patterns, and realize such potentialities is one of the more important jobs ... of the coming century.

As a clinician, the author has had a very high percentage of rape, molestation and domestic violence patients over the years. It is the engineering data from the analysis, diagnosis and treatment of these patients placed along side primate biology studies and the work of Dale Peterson and Richard Wrangham [2] that I base the following engineering theory upon.

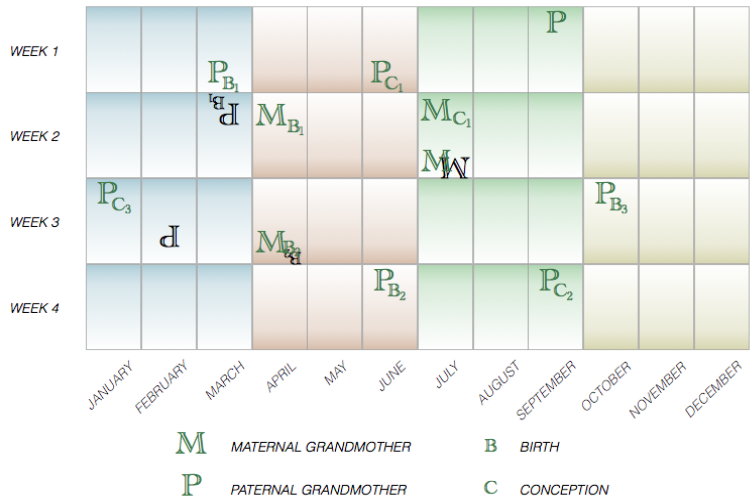
> Human society, over thousands of years, has prohibited what other primates would consider a normal amount of sexual contact. As a result, human children that are molested are subject to what electrical engineers would call a standing wave setting up within their bodies over time. Acting no differently than the

tectonic plates over the earth's surface, the stress that this standing wave creates on the body eventually leads to problems within the patient's body and between the patient and their family and community. As the patient's body is subjected to enormous surges and drops in power, and as the standing wave stops normal growth processes, swings through violence, love or rape, forcing conception as well, becomes the basis of the patient's life. In the case of a female, it will force her into weak conceptive cycles that become, over time, detrimental to her body as well as the children she conceived and the man that fertilized her to create them. Domestic violence and /or divorce eventually result in parallel illness and disease of various types to one or more parties. These cycles continue in the descendants of these patients.

The mathematical tools capable of modeling these processes have only been available for the last 30 years. These engineering inventions are a combination of computational biology, fractal mathematics and chemical engineering reaction kinetics. The author's research has identified a thermodynamic fractal equation that maps conceptive potentials, or conceptive flux, for a patient's lifetime.

This highly technical work, however, is based on very simple concepts. And these concepts can be used by any chiropractor, as this case will illustrate. The first question the author wants to answer has nothing to do with chiropractic or medicine. Why is such an emaciated and sickly individual conceiving so often in her lifetime? This, from an engineering perspective, is a more logical place to begin. Ancestral data from the patient's grandmothers was requested from the patient and is presented in Figure 1. This chart is simply an unlabeled calendar showing one week in a block. This is a way to spatially represent the year, no different than a clinician does in their appointment book. Using stacked rectangles, months are running horizontally and weeks are running vertically. The specific year is not desired; it is the pattern through the years that the author is interested in, therefore, all the data is put on the same calendar to reveal any annual patterns that are present. The green letters M and P show the approximate location in the year for the birthday of the maternal and paternal grandmothers, respectively. Green subscripts beside these letters, C and B, represent each woman's conceptions and births. Black letters, placed upside down represent death, either of the zygote, the child, or the woman.

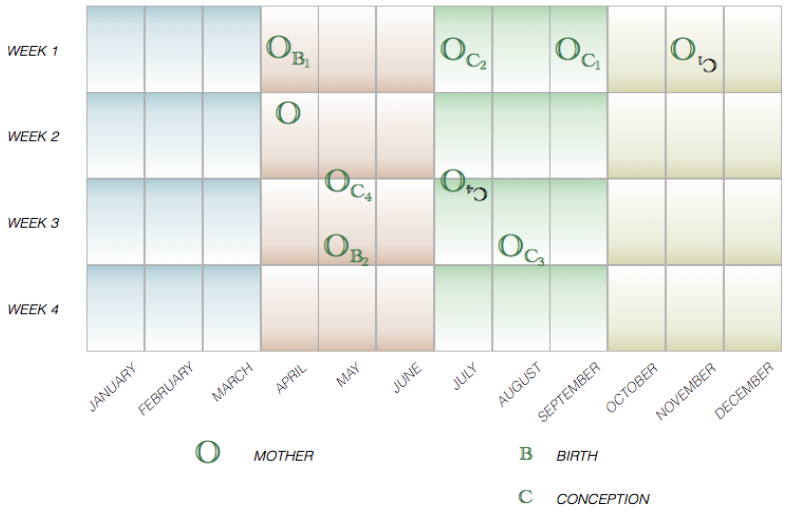
Figure 1



The maternal grandmother's data raises concern. The maternal grandmother was born on July 14th of 1901 (M). She, atypical of her generation, conceived her first child at 35. The patient's mother was born on April 9th of 1937 (M_{B1}). She conceived only once more in her life, this time, at age 42. She conceives within the same month as the first child, carries this child full term, but the child dies in childbirth. The patient's mother nearly died as well. This event provides the first piece of enteric structural evidence necessary to understand the patient's case from an engineering perspective. She dies only two days after her birthdate, on July 16th, 1982 at age 81 (inverted M). This event provides the second piece.

Next, the patient's mother's data is mapped in the same way, shown in Figure 2.

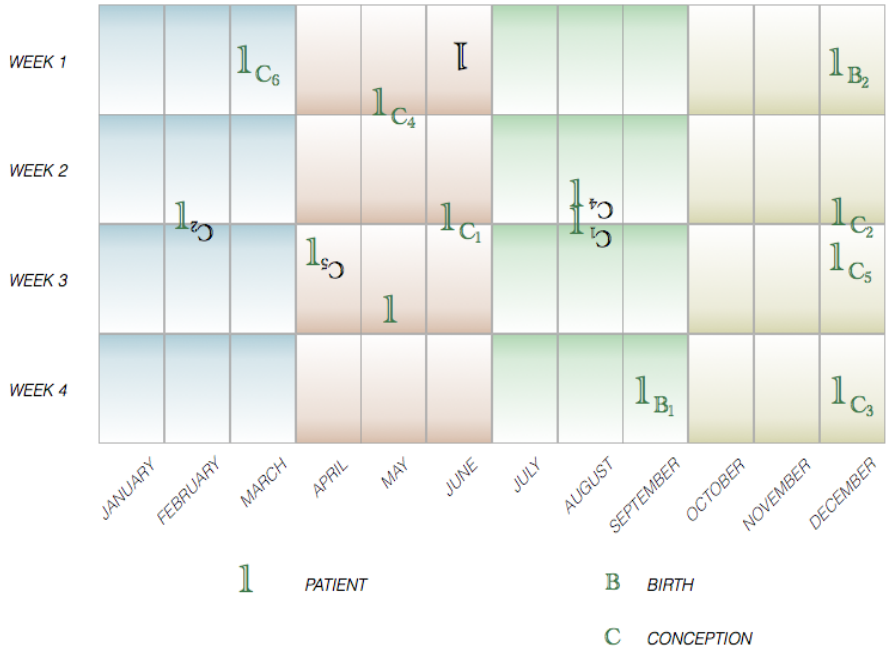
Figure 2



The patient's mother's conceptive history is also turbulent. The patient's mother was born on April 9th, 1937. Out of 4 conceptions, she had two children. Her 1st and 4th conceptions resulted in miscarriages at approximately 8 weeks. To the best of her recollection, she conceived first in the fall of 1964, losing that fetus in November. She conceived again in July of 1965 and her first child is born just 6 days before her birthday on April 3rd, 1966. Her third conception is the patient. "She kicked so much I thought she was a boy...and I had terrible postpartum depression after she was born". When asked to elaborate she replied. "On September 7th I woke up with a terrible headache, and I never get headaches. It lasted a full day and then I couldn't sleep or function, even with the simplest chores". Her husband had to take 2 weeks off from work to attend to her and the kids. When asked why she called it postpartum depression, since the child had been born on May 21s, she replied, "That's what the doctors said it was. They said sometimes this happens with the second child". She continued in this state for 2 1/2 months. "As Christmas came, I began to get better. I remember finally saying to [her husband], "I want to clean the house." This event provides the third piece of enteric structural evidence necessary to understand the patient's case from an engineering

perspective. Her fourth conception lines up around the time of the 3rd child's birth in 1972. Her body miscarries 8 weeks later.
Next the patient's conceptive history is mapped in the same way, shown in Figure 3.

Figure 3



The best that the patient can recall is her first conception, at age 18, in June of 1987. This fetus is miscarried about 8 weeks later. With the same man, she conceived again 18 months later. She chooses to abort this fetus at about 8 weeks. She meets with the father of her first child and conceives a 3rd time, around the end of December in 1994. This conception resulted in the birth of her first child. She conceived again sometime in the first half of May in 1997. The patient went into cardiac arrest on June 4th. She was clinically dead for about 30 minutes and was not expected to live. She came out of the coma, was fitted with a defibrillator and returned home 10 days later. The fetus continued to grow, but not significantly, and the patient underwent a D and C approximately 8 weeks after leaving the hospital. She conceived again in December of 1997 and miscarried about 4 months later. The last conception resulted in a second child. The child arrives with Mosaic Turner's Syndrome, was carried almost to full term, and weighed 3.5 pounds when born.

Figure 4 shows all 4 women's data together.

Although seemingly simple, this is a very effective tool for evaluating basic ENS turbulence for a patient, male or female. It requires very little time, no expense, and no special training for the practitioner. With this as a foundation, the patient's medical files from three hospitals were requested. Only one was received. In addition, the patient's mother had kept records of additional events. Mapping the patient's hospitalizations to this ENS map, a definitive pattern is identified by the following observations. In figure 5,

Figure 4

S stands for seizure, G stands for gastrointestinal bleeding, and A stands for alcohol detoxification.

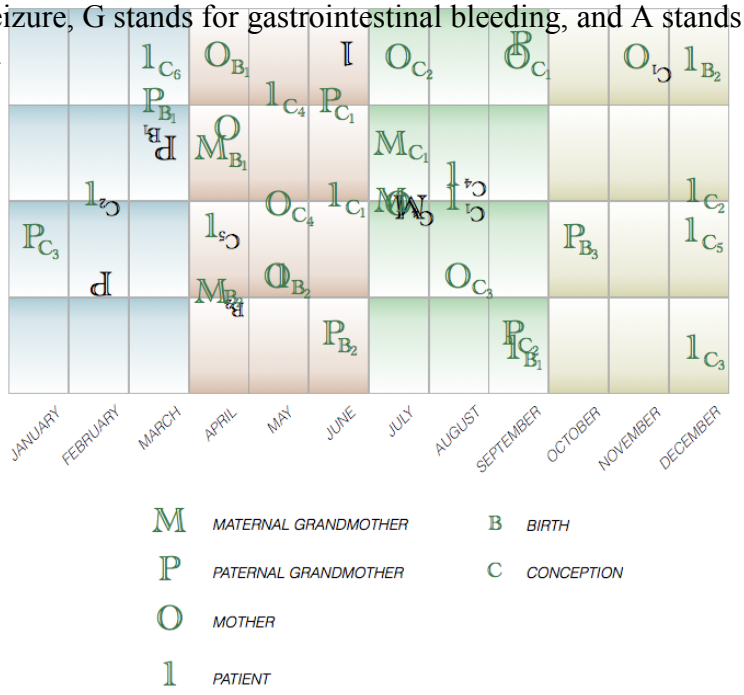
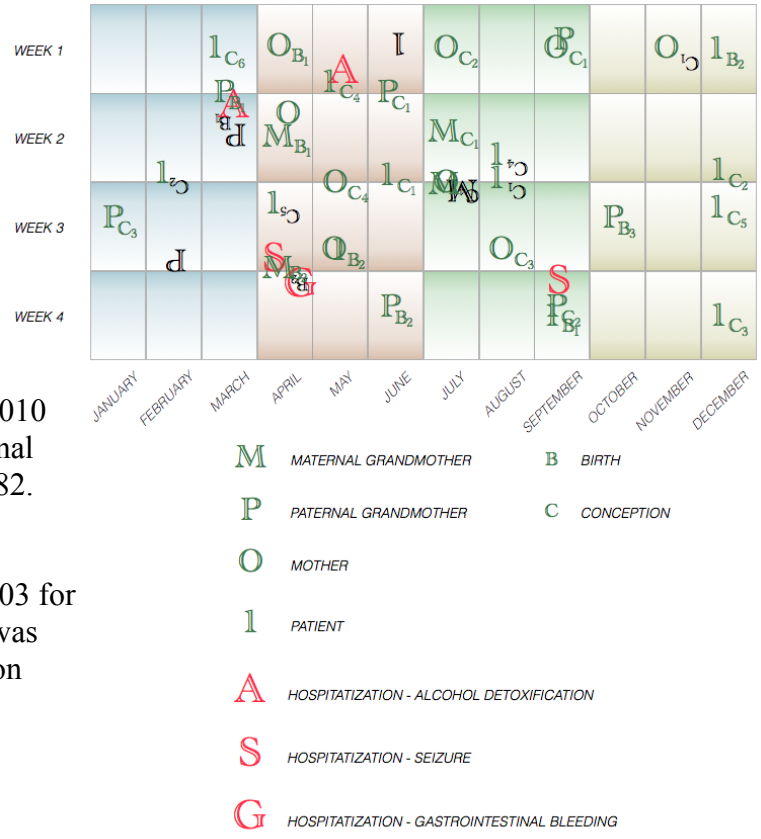


Figure 5



1. The patient was admitted on 4/24/2005 with a grand maul seizure (S) and on 4/23/2010 with gastrointestinal bleeding (U). Her grandmother's 2nd child was stillborn on 4/23/1942.

2. The patient was admitted on 7/16/2010 with vomiting of blood. Her maternal grandmother died on this day in 1982.

3. The patient was admitted on 3/9/2003 for alcohol detoxification. Her father was born on March 6th, 1937 and died on March 11th 2010.

Discussion:

This is a small portion of the data associated with the engineering file and represents an easy, non-technical way that chiropractors can easily identify, without additional training or time, enteric problems in patient care.

There are much more elaborate ways to analyze this data which won't be discussed here. The important point is that the additional data is not necessary to see enteric process control problems in this woman's life. This removes the clinician from having to make any determination at all. Using this very simple engineering technique, upset conditions are mapped around birth and death events in the ancestral line. Removing all labels, both chiropractic and medical, this woman can be seen, from the data, to be stuck in the turbulence of the creative process.

The critical timing for treating this patient concurrently with chiropractic was November. In Figure 5, it is easy to find why November was chosen. This month, for these 4 women, was enterically quiet. This is shown by the lack of data in November. There is only one enteric event here: the first miscarriage of the mother in 1964. The 3 weeks at the end of November are blank. During the month of November, the patient was treated with typical SOT protocols, focusing on her skull, her jaw and her pelvis. She was also taken to the Rehabilitation Department for addressing the hamstring issue. Nothing extraordinary was done in this department either. In addition, she found a chiropractor near her home to continue receiving physical manipulative care following these three days. The patient was instructed that it was critical to be compliant regarding practitioner visits.

The day after her visit to rehab, she began her menstrual period. Her menstrual period had disappeared when her dad died in March. This was the indication that the treatment would be successful over time. Over the next 8 weeks, for the first time in many years, hear body started to gain and hold weight. At the end of the year, she contacted the author in tears because she could not adequately express just how different her life had become. She was thrilled. She was still compliant with her scheduled chiropractic appointments at home. She was not lost in a fog of confusion all the time. She was in control and had no desire to drink.

It is a space-time structure that the chiropractor is viewing, looking at these graphs. The clinician is reviewing data that spans over 100 years in an extremely simple way. The chiropractor can then be capable of making a quantitative engineering based determination about why this woman has struggled with eating disorders, alcoholism, and domestic violence for 2 decades. This removes the clinician from the problems of science and a lack of process control data.

Conclusion:

This patient was likely molested as a child with no conscious memory of the event. Patients such as this are very difficult to process through physical based manipulative therapy. This opportunity allowed two practitioners to introduce her to this type of care. Once she experienced the power of the process, she was very excited to be a participant in her process.

The Thomas Meyers quote from above holds the phrase, "We have stepped over the line from remediation of biomechanical inefficiency toward the realm of the somatic psychologist." The author disagrees. In the author's experience, patients such as this end up with a strong resistance to psychology and psychologists. This patient is no exception to that rule. Using this data, it is clear to see her problem is not "mental" or "psychiatric" or "medical" or "chiropractic."

A chiropractor can find similar research opportunities in their practice simply, easily, and with little to no added risk, by applying the techniques discussed in this publication. This case is founded upon the most elementary engineering principles in process control. These elementary principles, requiring no formal engineering training for the chiropractor, provide a critical opportunity that is currently missing in all of healthcare.

This case is an excellent example of how engineering and chiropractic care can be administered concurrently by a chiropractor without the use of complex mathematics and difficult equations. In addition, these opportunities are, through this publication, being given to the SOT chiropractic community and require no training or certification by HBRC to begin implementing in their practice. Further study of this methodology in case controlled and randomized studies could yield both clarification and validation of this novel approach to diagnosis and guiding therapeutic applications.

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Adjusting a tooth? A case series.

Linda Power, DC, Charles L. Blum, DC

Introduction:

Manipulation of a tooth has been discussed in the literature [1] over the past few decades yet has not been presented in research conferences or in the peer review literature. It is unclear whether pressures or manipulation upon the teeth, which appears to improve patient symptomatology (e.g., reduced pain at rest, in occlusion, or when chewing), is associated with actual mechanical changes in tooth position or more related to reduction of neurological excitation.

Initial thoughts regarding tooth pain believed that pain as a result of external stimulation is more likely to be due to physical factors affecting the enamel and dentine than to actual pulp disease [2]. However a study found through evaluation of neuromagnetic fields that a cortical representation of tooth pulp sensation in humans appears to be located in the upper bank of the anterior Sylvian Fissure, corresponding to the anterior end of the secondary somatosensory cortex [3]. Another study utilizing magnetoencephalography also noted cortical responses with magnetic waveforms observed with stimulation of teeth with active pulp. However, no response was seen when stimulation was applied to pulpless teeth, such as devitalized teeth. Like the prior study areas of cortical representation for the teeth with dental pulp was located in the anterior-inferiorly area of the primary somatosensory cortex [4]. Jantsch et al concluded that "tooth pain activates a cortical network which is in several respects different from that activated by painful mechanical stimulation of the hand, not only in the somatotopically organized somatosensory areas but also in parts of the 'medial' pain projection system [5]."

This study evaluates the use of a functional assessment tool, the strength of a muscle [6], and pressure upon a tooth in various directions with a particular vector showing a functional preference.

Case Histories:

Patient #1 (TB) – 5 year old female, was treated with chiropractic sacro occipital technique (SOT) protocol her whole life for wellness care [7]. The patient was brought to the office by her parents and presented with front top left tooth pain that prevented her from eating for the prior 2 days. She was checked and adjusted using SOT protocol but still had severe tooth pain with any pressure.

Patient #2 (JVA) – 68 year old female, dental receptionist, was adjusted utilizing SOT protocols for almost 20 years by associate and complained from 16 October 2006 of tooth pain right upper molar without any overt dental pathology according to her dentist. She was adjusted utilizing SOT protocols October 16th, 20th, 24th, 31st, November 7th, and

14th. When she still had the pain on the 24th, her teeth were tested and the right upper 3rd molar was adjusted counterclockwise (CCW).

Patient #3 (BV) – 58 year old female had been seen for SOT wellness care [7] for over 10 years. She first presented with right mastoid area pressure and pain as well as numbness of the right TMJ and right back teeth. She reported that all these symptoms appeared after a root canal therapy in 1990. SOT protocols were utilized and her condition improved. A bite splint was given to her by her dentist on 20th of June, 1996. Her condition improved when treated with SOT category analysis, specific SOT cranial TMJ therapeutic approaches. Approximately 15 years later she had noted tooth pain which according to her dentist was not dentally or occlusally related. The right 2nd upper molar (not the root canal tooth) was adjusted clockwise (CW) according to muscle testing and the patient reported that the tooth was sensitive to this adjustment.

Patient #4 (CF) – 60 year old female physiotherapist, receiving SOT wellness care [7] for over 15 years. On 21st August, 1997, she complained of tooth pain from a crown restoration to the left upper 2nd molar. SOT protocols revealed no active categories and her dentist determined that no dental pathology or occlusal disturbance was found. Following her SOT examination and treatment her teeth were evaluated and based on pre and post muscle testing an adjustment to the left upper 2nd molar was performed from medial to lateral. The patient reported her tooth pain was eliminated when she was seen on her follow-up visit, 27 September 1997. On 24th April 1998, she reported that at her dental check-up, the dentist had taken x-rays and found that she had had a tooth abscess sometime in the last 6 to 12 months that would have been very painful but appeared to have healed completely. She was free of tooth pain until the 9th of January 2002 when she complained of right lower tooth pain. SOT protocols were followed and then the teeth examined and a right inferior back molar was adjusted medial to lateral.

Patient #5 (AF) 31 year old female student receiving SOT wellness care [7] for over 15 years. On September 1994 the patient complained of front upper tooth pain. After SOT protocol adjustments were performed, her teeth were checked and her front right upper tooth was adjusted CCW.

Treatment:

Prior to any adjustment to the teeth all SOT category work, adjunctive therapy, and cranial TMJ work would performed. This is necessary to rule out any other related factors that might affect her posture, occlusion, or stomatognathic system which could be contributing to tooth pain.

The protocol involves using a manual muscle test [6] as a functional assessment tool to evaluate a patient's response to adverse stimuli and to determine if a position preference or vector of force directed to a tooth could have a positive affect whereas pressure in the opposite direction would not. Once a sensitive tooth can be determined vectors of force are applied in a gentle manner in the follow directions: clockwise (CW),

counterclockwise (CCW), medial to lateral (M-L), lateral to medial (L-M), anterior to posterior (A-P) and posterior to anterior (P-A). Whichever test muscle test function determines the direction of correction. With the use of a gloved hand, gentle pressure is applied to the sensitive tooth in the direction that improved strength for about 20 seconds. Then the tooth is retested in all directions until no vector of force creates a weakening of the testing muscle. This will usually coincide with reduced pain and sensitivity to the treated tooth.

Results:

Patient #1 (TB) - The left front tooth was "adjusted" and the pain diminished enough that she could eat very soft food. A second adjustment to the tooth was done 2 days later with full recovery immediately.

Patient #2 (JVA) – Following adjustment of the 3rd upper right moral in a CCW direction her pain completely disappeared.

Patient #3 (BV) – The Right 2nd upper molar that was adjusted CW was examined a couple days later and then two weeks later and she reported that her tooth was no longer present and was surprised at the continued relief.

Patient #4 (CF) – Following the adjustment to the left upper 2nd molar the patient reported that her pain had subsided and the pain did not return as of an office visit one month later. Approximately 6 months later a dental evaluation and radiographs noted a tooth abscess sometime in the last 6 to 12 months that would have been very painful but appeared to have healed completely. The dentist reported this to the patient before the patient had made any mention of the pain or treatment at my office. She was free of tooth pain until the 9th of January 2002 when she complained of right lower tooth pain. Following similar treatment to the other tooth she reported the next day that the tooth was improved and she has remained stable for the past 8 years.

Patient #5 (AF). Following CCW adjusting to the patient front right top tooth the patient reported that her pain had decreased the following day. Subsequent 4 office visits over the ensuing 2 months revealed complete resolution of her pain without need of any further adjustment to her tooth.

Discussion:

Walther suggested two reasons for the change in pre and post muscle test [6] function associated with pressure upon a tooth. There may be an effect on muscle function because "(1) there is pathology of the tooth or periodontal tissues, or (2) there is a disturbance of the receptors in the periodontal ligament [1]." He theorized a mechanical cause assessed by pre and post muscle test function may be possible if the tooth is malpositioned in the alveolar socket, "possibly from some destructive force during

mastication [1]." His working theory of the test and treatment came from the premise that "the periodontal ligament could be traumatized, possibly with adhesions which interfere with its normal function [1]."

It is possible that just as joints can have dysfunction, leading to increased sensitivity and inflammation, that a dysfunctional dentoalveolar junction may also have increased pain and inflammation. The periodontium is the supporting structure of a tooth and helps to attach the tooth to surrounding tissues and to allow sensations of touch and pressure [8]. It consists of the cementum, periodontal ligaments, alveolar bone, and gingiva. Periodontal ligaments connect the alveolar bone to the cementum. Alveolar bone surrounds the roots of teeth to provide support and creates what is commonly called an alveolus, or "socket". Along with the periodontal ligaments the roots of the teeth which have hair-like rootlets help to anchor the tooth in place and may give feedback to both touch and pressure. It is possible that the ligament or root follicles can be irritated by micro movements which in turn aggravate the nerves, vascularization and bioelectric activity to the tooth within the dentoalveolar complex [9,10].

Conclusion:

Five different patients responded favorably to an "adjustment" of a sensitive tooth in a specific vector. It appeared that the condition was not responding to a wait and see approach and that there did not seem to be any related dental pathology or disorder. All patients were first treated with SOT procedures so it is unlikely that there were any ascending postural dysfunction affecting the sensitive tooth. Further study is need into this method of treatment and caution should be taken so that care is performed in conjunction with proper dental co-management.

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Introduction of Ayurveda to Chiropractic, Building a Functional Bridge.

Dov Pine

Introduction:

Chiropractic and the ancient system of Ayurveda share the common goal of facilitating complete and balanced transmission of life-force for the patient. Chiropractic focuses on the nervous system through structural bodywork whereas Ayurveda involves a myriad of methodologies. Nonetheless, both systems view the nervous system as the primary interface for the life force that connects human beings to the cosmos. A functional bridge maybe developed between the two systems given this philosophic agreement; specifically for the purpose of integrating a deeper analytical approach to care for the Chiropractor. The following discussion will for that purpose address Ayurveda's background and principles, methods of analysis and diagnostics and finally methods of treatment. It will also address current scientific and medical research that recognizes the scientific basis of Ayurveda and serves to conceptually bridge Ayurvedic knowledge for advancements in modern medicine and sciences. The paper will finally propose relevancy for integrating a bodywork component of Ayurveda (Marma Chikitsa) into the Sacro-Occipital Technique (SOT) form of Chiropractic.

Basic Concepts of Ayurveda:

Ayurveda means "Science of Life" and as the world's ancient healing system dates back some 5,000 years. Health in Ayurveda is considered a state of balance between body, mind and psyche that parallels the biological constitution at the time of birth (Prakriti Dosha or prototype). Dosha is considered genetic makeup but is largely influenced by environmental interactions. Ayurveda addresses all aspects of life ranging from daily to seasonal regimens and utilizes a diverse methodology of treatments including diet, herbs, bodywork, Yoga/meditation and more. Ayurveda treats the mind-body-spirit of the patient in a manner that considers all three inseparable and mutually influential. It further considers development of consciousness as a principle objective in the maintenance of health and advocates patient participation beyond the clinical setting. Like Chiropractic, Ayurveda does not treat disease rather it balances and harmonizes internal and external forces in the body so that the patient will express a complete life force.

Ayurveda emerged from the ancient texts of India whose religious expression was largely cosmological (***Textbox*** 1). The enumeration of unmanifest (Avyakta) to manifest (Vyakta) described in these texts, as the creation process, explains how the human body and mind as well as all matter is a manifestation of interactions between five elements (Pancha Mahabhuta).

Textbox 1: The roots of Ayurveda are found in the ancient Vedic texts: Rig Veda, Sama Veda, Yajur and Artha Veda. Ayurveda is considered an upaveda or subsystem within the Artha Veda. Although these texts are believed to be more than 10,000 years old, the Charaka Samhita dated 400 C.E. is the oldest known Sanskrit text that deals specifically with Ayurveda. Samkhya is the cosmological science of the Vedas and enumerates the principles of the universe, the dynamics of which Ayurveda employs as an expression for restoring and maintaining health. Samkhya in Sanskrit can be dissected into two words mean Truth (San) and to realize or know (Khya). The Samkhya background gives Ayurveda its unique orientation of establishing health by mirroring balance of the human body and mind with that of the universe.

The states of matter are Ether, Air, Fire, Water and Earth and they form the human body in different combinations giving basis for the Ayurvedic theory of Tridosha.

Elements	Form of energy	Physiological Role	Mental Function
Ether (Akasha)	Nuclear	Auditory	Distinguish between right and wrong
Air (Vayu)	Electrical	Tactile, Circulation	Impulse and movement
Fire (Agni)	Radiant	Digestion, Metabolism	Objective perception
Water (Jala)	Chemical	Taste	Flexibility and emotion
Earth (Prithivi)	Mechanical	Olfaction	Resistance

The Pancha Mahabhuta organize into three specific functions recognized as requisites for any living system: ether and air form Vata Dosha (input-output); fire forms Pitta Dosha (throughput or metabolism); and water and earth form Kapha Dosha (storage). These relationships of input-output, throughput and storage determine regulative behavior at cellular, physiological, systemic and mental levels thus maintaining micro/macrocosmic consistency in Tridosha Theory [1,2]. Harmonic balance between these elements as they form the Doshas results in health. Ayurveda uses the terms Prakriti to mean primal nature in both the cosmological sense as well as individual biological constitution. As each cell and system is composed of varying amounts of the Pancha Mahabhuta; cells, systems and ultimately the individual is recognized as having a Doshic predominance. In this manner Ayurveda establishes Prakriti Dosha as Biopsychological prototype for individuals.

Since Pancha Mahabhuta and Tridosha are considered cosmological expressions in their intangible forms (***Textbox 2***). Ayurveda observes the human body and all of its processes as a reflection of the universe. Health is achieved by restoring and maintaining functioning of the Doshas to their Prakriti (birth state), eliminating all factors that distort this reflection. The Doshas comprise the human body along with the dhatus (tissues), malas (wastes), gunas (psychological forces) and srotas and nadi (physical and energetic channels).

Textbox 2: Samkhya delineates a series of 24 developmental stages in the creative process in which the Pancha Mahabhuta are a gross manifestation or end stage for the transmission of sensation and expression of physical structures.

Prakriti examination is a central concept in Ayurveda. It classifies the phenotypes of individuals based on the predominant Dosha at birth, which in turn expresses specific physical, physiological and mental traits- biopsychological prototype. Each person is a unique product of genetic, environmental and psychological factors that influence and alter the equilibrium between Doshas. Vikruti is the term given to doshic imbalance and the disease state that results from maladaptation in input-output, throughput and storage systems. Recognition of Prakriti Dosha and point of deviation (Vikruti) due to changes in the Tridosha is unique to Ayurveda giving specific reference to distortion patterns at

cellular, physiological, systemic and mechanical levels. No other health discipline utilizes this concept. Indian scholars in recent years have begun to research the concept of Dosha Prakriti as it pertains to the human genome, a project serving to establish full scientific basis to Tridosha and Ayurveda [1,2].The following will briefly discuss the Tridosha in regards to attributes, physiology, visceral and systemic roles as well as psychological expression.

Vata:

Vata means air, "that which moves" and is responsible for mobility and motility. Composed of ether and air, Vata is the input-output principle acting as the motivating force and animator of the other two Doshas. Its attributes are dry, cold, light, rough and agitated. Vata governs the central, autonomic and peripheral nervous systems and all forms of physiological and systemic movements including membrane transport, respiration, ingestion, ejection, assimilation, circulation and elimination. Vata resides in the colon, pelvic girdle, bones, thighs and the organs of hearing and touch. Vata's primary site of aggravation or disease is the large intestines. Prana is the animator of Vata, its subtle force which in turn animates all other systems. Disorders of Vata involve neurological conditions [3,4]. Frawley [3] and Lad [4] provided textual information on the Doshas and their features. The information presented unless otherwise cited is based on their works.

Forms of Vata	Element	Location	Function
Prana	Ether	Central nervous system	(1)Governs higher cerebral activities including respiration, thinking and feeling. (2) Transformation of optical and auditory input from sensation to feelings, emotion and finally thought. (3) Controls the other vatas.
Udana	Air	Chest, diaphragm, nasal and pharyngeal passages	(1)Exhalation, coughing, vomiting, sneezing. (2)Initiates efforts and upward movements (3) Involved in memory recall, speech and self-realization.
Samana	Fire	Abdomen	(1) Involved in the mechanical processes of digestion, absorption, assimilation and movements of chyme within and between chambers.
Vyana	Water	Heart	(1) Maintains arterial, venous and lymphatic circulation. (2) Responsible for physical movements and activities controlling voluntary and involuntary movements, especially at the joints.
Apana	Earth	Lumbo-sacral, inguinal, genito-urinary and gluteal regions	(1) Governs downward movements of defecation, flatulence, urination, ejaculation, parturition and menstruation.

Pitta:

Pitta is the fire humor and means "that which digests." Indeed Pitta as the throughput function is responsible for all chemical and metabolic processes. It additionally regulates mental digestion i.e. from sensation to thought, emotion and discrimination of reality. Pitta is composed of fire and water and is hot, sharp, light, oily, mobile and liquid. Pitta functions in digestion, oxidation-reduction, conjugation, phosphorylation, enzymes and hormones [5]. The major sites of Pitta are the stomach, duodenum, liver, spleen, pancreas, heart, eyes and skin. The main site of disease for Pitta is small intestines. Disorders of Pitta involve digestive, metabolic and enzymatic conditions.

Forms of Pitta	Element	Location	Function
Sadhaka	Ether	Heart, gray matter of the brain and synaptic spaces	(1) Governs normal functions of memory, cognition, comprehension, awareness. (2) Digests perception into thought.
Alochaka	Air	Eyes: retina, lens, cornea, iris and optic disc	(1) Regulates vision
Pachaka	Fire	Stomach and small intestines	(1) Digestion, absorption and assimilation by enzymatic activities.
Ranjaka	Water	Liver, spleen, intrinsic factor and blood	(1) Hematological activities: hematopoeisis, preservation and destruction. (2) Production of bile, liver enzymes, cholesterol, hemoglobin. (3) Gives color to the eyes, blood, urine and feces.
Bhrajaka	Earth	Skin and subcutaneous tissue	(1) Regulates skin temperature, moisture-sebaceous secretions, pigment, vasomotor function and tactile perception.

Kapha:

Kapha though translated as phlegm means "that which holds things together." Composed of water and earth, Kapha is the storage function and is responsible for maintaining moisture, lubrication, insulation and providing support to tissues and systems. Kapha makes up the bulk of bodily tissues. Its qualities are wet, sticky, cold, heavy, dull, soft and firm. Kapha resides in the chest, throat, head, pancreas, stomach, flanks, lymph, plasma, adipose, nose and tongue. Its function resembles the lymphatic and immune systems, adipose, mucus and mucoid systems [5]. The main site of disease for Kapha is the stomach. Disorders of Kapha involve problems related to lipid metabolism as well as mucus secretion. Vata governs the functions of both Pitta and Kapha. Pitta requires the lubrication and insulation provided by Kapha or else the body would burn up. Kapha requires Pitta to continuously utilize its materials or else the body would congeal over. Each Dosha is required for the functioning of the other. Deficiency or excess of one impairs all systems causing a breakdown in self-regulation.

Forms of Kapha	Element	Location	Function
Tarpaka	Ether	White matter of the brain, myelin, cerebrospinal fluid, interstitial fluid, mucosa of nasal and sinus cavities	(1) Nourishes and protects the nervous system via CSF and myelin sheath. (2) Stores memory and experience
Avalambaka	Air	Chest, lungs, pleural fluid	(1) Regulates moisture and lubrication of alveoli (2) Facilitates the functions of the other Doshas by providing sufficient moisture and lubrication.
Kledaka	Fire	Stomach and upper GI	(1) Liquefies food (2) Forms the protective mucosal linings of the GI (3) Maintains pH equilibrium
Bodhaka	Water	Oral cavity and saliva	(1) Lubricates the oral cavity and throat (2) Taste perception (3) Aids in mastication.
Sleshaka	Earth	Synovium of joints and periosteum	(1) Lubricates joints.

Dosha as Biopsychological Constitution:

All individuals are composed of the same biomaterials; however people have a predominance of one or two of the Doshas. Rastogi and Chappelli state that Ayurveda proposes to identify Dosha predominance already in the developing fetus [1]. Thus Prakriti Dosha or birth constitution is determined prenatally. Tridosha categorizes biopsychological constitution types for individuals, establishing a prototype return point for the physician to accurately address deviations in function and etiological relationships. There are seven possible Dosha combinations: Vata, Pitta, Kapha, Vata-Pitta, Vata-Kapha, Pitta-Kapha and Vata-Pitta-Kapha. The three pure Doshas can be described in terms of physical features, metabolism, emotional predisposition as well as other characteristics.

Additionally, the Doshas are predisposed to specific types of medical conditions or symptoms. Reflection upon the dominant element in the Dosha helps to explain this phenomenon. Vata is composed of ether and air. Its features and clinical disposition are light, inconsistent, ungrounded and desiccated; all of which are effects of the wind. Pitta, composed of fire and water, is well balanced in metabolism and physique. Disorders and conditions common to Pitta normally reflect excess of metabolic activity resulting in febrile and inflammatory conditions. Pitta is passionate and assertive in both positive and negative ways. Whereas Vata psychologically is ungrounded with anxiety, Pitta is impatient, angry and hostile. Kapha as earth and water is stable and grounded giving consistency and dependability. Earth gives Kapha a large and broad physique but also attracts accumulation of tissue and adipose. Kapha has an attached personality and tends towards greediness, depression and being emotional.

Physical Characteristics	Metabolism	Psychological	Common Conditions and Disorders
Vata types are shaped by the wind			
Thin light weight; difficult to hold weight; poorly developed physique; skin that is thin, dry and cold; prominent veins; dull complexion; receding gums; thin and visible joints; unsteady joints with crepitus.	(1) Erratic and variable appetite (2) scanty and colorless urine that passes with difficulty, (3)scanty and hard stool that passes with difficulty, prone to constipation, (4) irregular and general lack of sweat	Fast to act; adaptable; changes easily; erratically talkative; indecisive; learns and forgets quickly; artistic, esoteric, shy, sensitive, enthusiastic, fearful, anxious and nervous, hysteria and trembling, anxiety.	Dry skin, constipation, irregular appetite and metabolism, receding gums, cramps, flatulence, shivering, stuttering, insomnia, neuroticism and paranoia. More substantial diseases involve rheumatism, nervous disorders, sciatica, osteoporosis, poor blood circulation, irregular menstruation, anorexia and suicidal tendencies.
Pitta types are fiery and have a tendency to burn			
Body of medium stature with well developed muscles; strong and constant metabolism; ruddy or glowing complexion; warm and moist skin; prone to baldness.	(1) Strong appetite, (2)profuse brightly colored and perhaps burning urine, (3) abundant and loose stool, burning, sometimes yellow in color, with tendency towards diarrhea (4) profuse hot sweat with strong odor	Adaptable to change but need convincing; argumentative, assertive and passionate; critical and penetrating, sharp memory; impatient, angry and irritable; temper and rage and tantrums.	Ulcers, stress related disorders, diarrhea, thrombosis, inflammatory disorders (lymph system and spleen), hepatitis, infectious diseases, febrile conditions, urinary tract infections and jaundice.
Kapha types are grounded in the earth and tend to stagnate			
Large or full body physique; tend toward obesity; strong bones and teeth; thick hair; thick, moist and cold skin; pale complexion, high physical endurance but need to be pushed to be active.	(1) Constant yet low appetite, (2) moderate and whitish colored urine, (3) moderate and solid stool, sometimes pale with presence of mucus, (4) moderate and cold sweat.	Very difficult to break old habbits; slow and reserved; dull; slow learner but does not forget; tranquil and sentimental; laziness and lethargy; patient; polite; dependable; generous; may have a tendency for materialism and greediness; are attached; depression and indifference.	Conditions that are cold, mucosal and stagnating in nature including respiratory disorders, nausea, colds, asthma, tumors, fungal infections, edema, swollen lymph nodes, diabetes, bronchitis, goiter, digestive problems and obesity.

Interestingly, in Ayurveda one Dosha is not considered better than the other. They all have neutralizing qualities. For example, when it comes to health Vata types are most prone to illness. However, they recuperate the fastest and have the qualities of change and transformation to facilitate the healing process. Kapha individuals have the strongest immunity, but experience the longer and more difficult recovery times once they succumb to illness.

Mental Components (Gunas):

In addition to the Doshas, Ayurveda recognizes three mental components called Gunas that reflect spiritual disposition.

> **Sattva** gives qualities of truthfulness, harmony, generosity, selflessness, etc. It is the principle of intelligence and illumination.
>
> **Rajas** gives qualities of self motivated ambitions, ego, pride, untruthfulness, distraction etc. Rajas is the principle of motion or energy.
>
> **Tamas** gives qualities of dull intellect, laziness, attachment and greed, perversion, evil, materialist. Tamas is the principle of materiality

The Gunas are utilized in the construction of mental constitution charts in combination with the Doshas. This serves in the process of evaluating non-physical etiologies and guides the process of general therapeutics as well as ethical/spiritual development facilitated in Ayurveda.

Tissues and Wastes (Dhatus and Malas):

Seven levels of tissues (Dhatus) are recognized in Ayurveda and are considered the sites of disease. They are listed from most gross to subtle: plasma (rasa), blood (rakta), muscle (mamsa), adipose (medas), bone (asthi), marrow or nerve (majja), and reproductive tissues (shukra). Tissue formation occurs when Agni or fire (digestive fire) processes a portion of gross tissue to the next one in line. Plasma forms blood which forms muscle and so on establishing self-nourishing cycle. Ultimately reproductive tissue, which is the most subtle or essential, produces Ojas (the immunity and vitality factor of life) and gives rise to new plasma.

It takes 5 days for plasma to be formed, and then another 5 days for plasma to form blood. Thus 35 days in total to form the reproductive tissue. This helps to explain the long term dietary therapies used in Ayurveda in rejuvenation therapies. Also, each Dhatu gives off certain waste products, is responsible for specific psychological functions and is associated with a specific Dosha. For example:

> *Asthi Dhatu (bone) is composed of earth and air and its porosity makes it a site for Vata. Asthi provides support and foundation for the body giving confidence and security. The teeth constitute its secondary tissue. In excess Asthi causes osteophytes, too large a frame, joint pains, arthritis, and emotions of fear and anxiety. When deficient, Asthi causes frailty, joint pain, insufficient bone formation, loss of teeth, hair and nails.*

Ayurveda further utilizes a concept of fire (Agni) that is responsible for both digestion and absorption of nutrients (Pakwagni) and as well their assimilation into 7 different levels of tissue (dhatwagni). Fourteen different channel systems (Srotamsi) facilitate input-output with the external world, supply the tissue systems and their communications and carry mental processes. They are activated by Prana and Ojas (vital essence). The Ayurvedic classics state "Srotomayam hi Shariram," that the living body is a system of channels gross and subtle, tangible and intangible, biologic and energetic; and that all life processes depend on the integrity of their function. Pathogenesis observes Doshic imbalances and the impairment of Srotas and Dhatus in determining etiologies, expression of disease and its stages [6].

Pathogenesis (Samprapti):

The "Land and Seed Theory" used in Ayurveda explains that the body and mind are as soil and disease the seed. When the physiology of the soil is maintained then the seed cannot germinate and take root [7]. Imbalance in Doshas, Srotas and Dhatus in addition to the mind constitutes a loss of physiological integrity allowing any seed to take root. Thus health in Ayurveda is combination of these balanced factors along with environment [5]. Prajnaparadha, which means "failure of wisdom", is considered first step involving that compromise. Indeed it means the result of not attending to innate intelligence and natural law [8].

Considering requisite functions of input-output (Vata), throughput or metabolism (Pitta) and storage (Kapha) for the existence of any living system, diagnosis begins by investigating disturbance of Dosha. Pathogenesis (Samprapti) is an evaluation of the stages of disease development with respect to deficits, excesses or qualitative disturbances in the sites of the Doshas [9]. It additionally traces etiological factors through specific disease pathways and observes distinct symptomology. Etiological factors are physical, mental and environmental. Equal attention is given to the relationships between patient and factors in determining etiologies.

Ayurveda designates six different stages of pathogenesis: They are Sanchaya (accumulation), Prakopa (provocation), Prasara (overflow), Sthana samsraya (deposition), Vyakti (manifestation) and Bheda (differentiation). The disease process begins when a Dosha is increased by an aggravating factor weakening Agni (the digestive fire). As a result undigested food mass (Ama) begins to accumulate. Together Ama and the aggravated Dosha accumulate and eventually start to block the Srotas and begin migration to a weakened site. In this case the Dosha is both the effected system and an etiological factor.

Sanchaya is the first stage of etiology and involves primary aggravating factors in which the Dosha as a vitiating force begins to accumulate in its home site.

Vata	Accumulates in the colon and presents as bloating and abdominal distension
Pitta	Accumulates in the small intestine and presents as hyperacidity and indigestion
Kapha	Accumulates in the stomach and presents as distension, heaviness in the epigastrium and tiredness following meals

Prakopa is the second stage and occurs when the accumulated Dosha now provokes the home site causing various local and systemic effects.

Vata	Constipation, distension and respiratory difficulty
Pitta	Nausea, periumbilical pain, vomiting and acid reflux
Kapha	Lack of appetite, mucus build up and congestion, belching and hypersalivation

Prasara is the third stage and occurs when the accumulated Dosha begins to overflow into the plasma and blood and spreads out into the rest of the gastrointestinal tract. The toxic Dosha now can penetrate other organs.

Vata	Dry skin, cold extremities, joint stiffness, lower back pain, heart palpitations, spasm, convulsion, headache, dry cough, tinnitus, constipation and difficult bowel movements, insomnia, anxiety and nervousness.
Pitta	Inflammatory dermatological conditions, conjunctivitis, gingivitis, GERD, dizziness, headache, high fever, bilious vomiting, burning diarrhea, irritability and anger
Kapha	Sinus congestion, dyspnea, swollen glands, low fevers, vomiting, joint swelling, edema and mucus in the stools

Sthana samsraya involves relocation of the Dosha from the circulatory system to a tissue. The tissue is generally a weakened site and is called Khavaigunya. The symptoms begin to remain fixed in location as well.

Vata	Cold, dryness, dry cough and sneezing
Pitta	Irritations, infections, inflammatory conditions and ulceration
Kapha	Congestion, edema and mucus formation

Vyakti is the stage in which Doshas manifest as clinical symptoms such as asthma, diabetes, rheumatoid arthritis and so on.

Vata	Radiating pain, debility and fatigue, emaciation, stiffness and muscle wasting, spasm and tremors
Pitta	The same its previous stage in addition to throbbing pain
Kapha	Obesity, metabolic changes, dull pains and gall and kidney stones

Bheda is the final stage in which the attributes of the Dosha are clearly reflected in the clinical symptoms (e.g. Pitta arthritis will present with fever, burning sensations, inflammation and loose stool).

Vata	General lack of function, osteoporosis, wasting, paralysis and deformity
Pitta	Perforation and ulceration, abscesses, hemorrhages and gangrene
Kapha	Profuse edema, stagnation, neoplasia, and arterial obstruction and occlusion

Diagnosis / Inspection:

The Charaka Samhita states that it not possible to name every disease because each individual is distinct in clinical presentation and manner of treatment. Although Ayurveda observes and identifies nature of the disease, i.e. symptoms it is more concerned with the imbalance of Doshas that produce the symptoms and are in need of correction. Still Ayurveda does refer to common diseases by names that correlate clinically with those of the west [10]. Distinguishing between the examination of the disease (Roga Pariksha) and patient (Rogi Pariksha) helps to form a tailor made management plan for the patient. Patient examination consists of Prakriti, disease (Vikruti), age (vaya), tolerance (satmya), mental state (satva), metabolism (aharashakti), physical endurance (vyayama shakti), tissue quality (sara), physical proportions (sanhanana) and finally strength (bala) [1].

The primary methods of diagnosis in Ayurveda are observation/inspection, palpation and history. Additionally Ayurveda utilizes a sophisticated analysis of pulse, urine, stool, eyes, tongue, skin, speech and voice as well as general appearance [5]. Marmani or vital points are also palpated for sensitivities to determine disturbance of Dosha. For example tenderness upon initial pressure that rapidly recedes indicates Vata disturbance. Tenderness felt throughout medium pressure indicates Pitta disturbance and tenderness only felt on deep pressure indicates Kapha disturbance. There are 117 total marma points and they each have unique physiological, visceral and psychological correlations, thus they can be used to determine various sites and levels of dysfunction [8]. Use of Marmani is of central importance to the later discussion for integrating their application into clinical SOT.

Therapeutic Methodologies

Disharmony of Pancha Mahabhuta cause imbalance of Dosha leading to maladaptation in regulative systems. Ayurvedic healthcare addresses the Doshas and Gunas (mental components) on multiple levels to restore balance. This involves eliminating etiological factors and toxins, clearing Srotamsi (channels) and restoring normal balance of Pancha Mahabhuta in accordance with Prakriti Dosha [1]. Treatments are distinguished as reducing or tonifying. The general rule behind therapies in Ayurveda is to eliminate toxins and their factors before tonifying the body.

Reduction therapies serve to eliminate Ama or toxins, aggravated Doshas, as well as environmental or lifestyle factors- addressing etiological components. This form of treatment is indicated in acute stages of disease and involves practices of discipline, giving things up and changes in lifestyle which promote self-inquiry for eliminating etiological factors [3,8]. Four main factors are involved in this process: cleansing (Shodhana), palliation (Shamana), rejuvenation (Rasayana) and mental-spiritual healing (Sattvavajaya) [5]. Cleansing is commonly the first step and it involves Panchakarma and Shamana.

> **Panchakarma** is the better known practice of cleansing and detoxification in Ayurveda. It utilizes five different techniques including *basti* (medicated enemas), *virechana* (therapeutic purging), *vamana* (therapeutic vomiting), nasya (application of medicated oils and powders to the nostrils) and finally *rakta moksha* (therapeutic release of toxic blood). The Shodhana stage serves to remove Ama and accumulated Doshas from sites present in organs, channels, marmani (vital points) or other weakened sites.
>
> **Oleation** and **sudation** therapies are normally applied prior to Panchakarma and involve softening and liquefying of the Ama and the Doshas and directing their withdrawal to the gastrointestinal tract to be removed using Panchakarma techniques.
>
> **Shamana** or palliation therapies are performed when the body is not strong enough to receive Panchakarma and the Doshas are not "ripe" enough to be expelled. It too is performed to reduce Ama but does not dispel the Doshas. The idea here is that sufficient toxins have accumulated and their removal might exacerbate the condition. Shamana has seven parts: herbs for burning toxins and stimulating digestion; fasting; fasting from water; Yoga exercise and mediation; sun and moon bathing; exposure to wind [3].
>
> **Lifestyle changes** – based on daily regimens and seasonal changes according to Dosha requisites.

Tonification therapies are designed to nourish debilitated systems and tissues whose deficiencies were responsible for disease. Tonification methods are indicated in chronic diseases, malnourishment as well as after reduction therapies have been performed.

Rasayana is a form of rejuvenation and revitalization performed once toxins have been removed from the body and serves to restore the body's innate intelligence and maintain optimal function [8]. In fact the term can be broken into two parts: *Rasa* meaning nutrition and *Ayana* meaning transportation into the body. Rasayanas serve to improve the nutritional value, improve digestion, bioavailability, microcirculation and assimilation. The practices involved are analogous to the modern use of dietary supplements [5]. Rasayana utilizes herbal formulas, *bhasmas* (mineral preparations) as well as forms of bodywork.

Additional therapies used in Ayurveda include Yoga and massage. The massage or bodywork component, more specifically Marma Chikitsa, is of primary interest to this paper. Marma Chikitsa is the use of vital points found on the different body tissues and junctions to treat diseases, strengthen the body as well as evaluate severity of condition. More specifically, it can be used to treat doshic imbalances; dhatu and strotas disturbance; visceral dysfunction; imbalances in Prana, Tejas and Ojas; pain relief by stimulating Agni and eliminating or detoxifying Ama; calm the mind and emotions; enhance awareness and serves as a form of preventative care. Marma Chikitsa is utilized in both reductionist and tonifying treatment programs.

Diet and lifestyle form a pillar of Ayurvedic care inside and outside the clinical setting. Diet and herbs are recommended to patients based on the principle of taste. Ayurveda considers six different tastes based on elemental combination: sweet – earth and water; sour – earth and fire; salty – fire and water; pungent – fire and air; bitter – air and ether; and astringent – ether and earth. Foods, spices and herbs are applied based on relationships of opposites. Each Dosha is composed of, relieved by and aggravated by different elemental combinations. Herbal treatments are utilized based on principles of taste (rasa), properties (guna), energetics (virya), post digestive properties (vipaka) and special effects (prabhava). *Bhasmas* or mineral herbal formulas are also utilized in different stages of care. These are well known for the uses of oxidized minerals such as gold, copper, mercury, zinc, diamond and others in special herbal formulas.

Ayurveda does not contain a concept of specialization as is common in western medicine. This is because the Ayurvedic physician treats the whole person and all systems and levels, not a specific organ, etc [4]. Nonetheless even though an Ayurvedic physician may specialize in a particular field e.g. ophthalmology he or she will treat the entire body and mind in order to correct and eliminate etiological factors.

Ayurveda and Modern Science and Medicine

Ayurveda has been gaining global attention and interest in the last decade due in part to its holistic approach in therapeutics; that fact that it is among the most extensive and profound conceptual bases within Traditional Medicine Systems (TMS) around the world; and because it has survived for more than 2 millennia as a vibrant medical system [5]. In the inaugural speech for the World Ayurveda Conference held in University of Pune in 2006, Dr. R.A. Mashelkar, Director General of India's Council of Scientific and Industrial Research (CSIR), announced that India can benefit enormously if it builds a

Golden Triangle between modern science, modern medicine and traditional medicine [11]. The purpose being to blend both modern and traditional synergistically to provide accessible and affordable health care to all people of the planet [7]. Later in 2009 the First International Congress on Ayurveda held in Milan featured experts from fields in both Ayurveda and modern science that fostered relationships between disciplines involving themes such as quantum physics, epigenetics and modern medicine [6].

Researching the scientific basis of Ayurveda is a new academic field pursued in India, serving to integrate Ayurvedic methodologies into allopathic practices in response to short comings as well as to express the principles of Ayurveda in scientific terms in Ayurvedic schools of India. Excitingly, both Indian allopathic and traditional institutions have shown reciprocating interests. Ayurveda schools in India have been "urging for scientific rooting of Ayurvedic principles" [9]. Additionally, medical institutions, primarily motivated with pharmaceutical interests, have been conducting research in the Ayurvedic field of Dravyaguna (herbalism) to benefit modern allopathic treatments.

Research performed by the CSIR in Ayurveda has been conducted primarily with respect to future pharmaceuticals; cataloguing and investigating the pharmacopeia of Ayurvedic herbal wisdom for identifying biochemical agents at work. Such medical studies have been conducted to evaluate the effectiveness of Ayurvedic herbal wisdom in treating chronic and degenerative disorders including depression, anxiety, sleep disorders, hypertension, diabetes mellitus, Parkinson's, and Alzheimer's disease [10].

Other scientists and physicians of both allopathy and Ayurveda have undertaken a mission to present Ayurveda in scientific terms to establish a formal bridge between disciplines. Dr. Lakshmi Mishra's compendium "Scientific Basis for Ayurvedic Therapies" (2004) and Rastogi's article "Building Bridges Between Ayurveda and Modern Science" (2010) as well as other articles are invaluable in that respect [5,9]. Studies of Tridosha and Prakriti have shown their relevancy in explaining processes of cellular differentiation, gene expression and ultimately genomes and phenotypes. These studies have opened the door to future research regarding epigenetics and their role in environmental or diet related susceptibilities to pathology [1,2] .The Oxford journal Evidence Based Complementary and Alternative Medicine (eCAM) has also contributed numerous articles in discussion of Tridosha and Ayurveda for scientific validity [12].

Ayurveda and Chiropractic

Dr. Betsy Singh former Dean of Research at Los Angeles Chiropractic College (LACC) along with Dr. Lakshmi Mishra published an article on the use of Ayurvedic therapies for treating arthritis. The article enumerated the Tridosha theory in determining Prakriti Dosha for patients and addressed specific herbs along with diet, lifestyle and Dosha indicated yogasanas [13]. In 1999 Singh established an Ayurvedic medicine research track at the LACC to perform studies on the effectiveness for using Ayurvedic herbs in treating conditions such as osteoarthritis, TMJ and fibromyalgia in conjunction with Chiropractic. Singh stated that "Ayurvedic therapies interface nicely with Chiropractic, with their

shared emphasis on wellness, prevention, lifestyle and belief in the body's innate capacity to heal itself" [14].

Her article "Ayurveda: Good Chiropractic Partner?" truly sets the stage for exploring the possibilities of blending Ayurveda and Chiropractic. It is common place that Ayurvedic therapeutics and its contributions to healthcare discussed in other disciplines are equated almost entirely with herbs (Dravyaguna), which represents a small fraction of the types of therapeutics provided [15]. Interestingly, the therapies and methodologies discussed in Singh's article did not touch upon Ayurvedic forms of bodywork, specifically Marma Chikitsa. As Chiropractors, it makes sense to utilize Ayurvedic physical strategies in synergy with adjusting. Much research has been performed on Ayurvedic herbalism and its applications in both allopathic and holistic clinical settings. This project will now propose relevancy for integrating Ayurvedic science and its physical applications namely Marma Chikitsa into the Chiropractic field. This may serve to deepen the level of care with regards to better understanding etiological factors, visceral and psychosomatic implications and finally specific therapeutic techniques. This process will not only supplement the level of Chiropractic care, but retain essence of Chiropractic as its ultimate goal is to facilitate unimpeded transmission of life force.

Sacro-Occipital Technique (SOT) with its branch of Chiropractic Manipulative Reflex Technique (CMRT) utilizes somatovisceral and viscersomatic reflex diagnosis to aid diagnosis and therapeutic applications. CMRT utilizes various organ involvement, investigates laboratory analysis testing (e.g., blood, urine, saliva, etc.), and can utilize other types of interdisciplinary diagnostic tools. Aside from co-treatment of patients with musculoskeletal or radicular pain, in 2010 a study [16] illustrated how chiropractic and acupuncture theory can work together to help treat a patient presenting with non-musculoskeletal conditions.

If acupuncture theory and principles along with CMRT can help diagnose and treat patients with non-musculoskeletal conditions it is reasonable that incorporating Ayurvedic principles and theory might also facilitate patient care. Since it is unlikely that one form of healing has all the answers, weaving the theoretical tenants of chiropractic, acupuncture and Ayurveda may help complementary alternative medicine practitioners better serve patients in need. The discussion presented in this paper can be used as a bridging point for Ayurveda its Marma Chikitsa, chiropractic, and particularly SOT's CMRT. SOT and CMRT may make an ideal partner for such cross-pollination; since it involves a multi-dimensional appreciation for neurophysiology, musculoskeletal as well as visceral relationships addressed in therapeutic protocols. Recently, SOT is espousing a unique philosophy of enhancing patient recovery and health by building relationships with other disciplines [17-8].

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Chiropractic care of a two year-old diagnosed with reflux and a hiatal hernia: A case report.

Martin G. Rosen, DC, Charles L. Blum, DC

Introduction:

Approximately 4 million babies born in the U.S. each year, up to 35% with reflux in the first few months of life, which may resolve by their first birthday yet some will never outgrow the condition. Beyond infancy, up to one fourth of children and adolescents have recurrent abdominal pain, whereas only 5% report heartburn or epigastric pain [1]. Surgical treatment (fundoplication) has mortality rates up to 4.7% with 6% having postoperative complications [2]. Therefore the onset of gastroesophageal reflux (GER) and hiatal hernia (HH) symptoms are on the rise in the pediatric population. The use of prescription medication including: Prevacid, Prilosec and Nexium in treating these conditions are generally not only ineffective but do not address the cause or complications of these issues.

"Gastroesophageal reflux, usually with associated hiatal hernia, is recognized as a cause of disabling esophageal and respiratory complications in all age groups; but, until recently, it has been thought to be an unusual problem in infants and children. Respiratory complications, now appreciated with increased frequency in the adult population, may also occur in the pediatric age group [3]." In a study by Gorenstein et. al., "among 718 children with GER, 45 children (6%) with associated HH were retrospectively studied. They were divided into those with neurologically normal development (NN, n = 35) and those with neurologic disorders (ND, n = 10). Presence of HH in children with GER is associated with prolonged exposure of the esophagus to acid and a high failure rate of nonoperative treatment. However, medical treatment should be tried in NN children despite the significant failure rate [4]."

Case History:

On August 31, 2009 her parents brought a one-year old female infant to my office for evaluation. Her initial symptoms and diagnosis as reported to me by her mother, was as follows: esophageal reflux, hiatal hernia, she did not sleep more that 1.5 hours at a time, would not (or could not) eat solid food, she did not crawl as an infant, she could not lay down flat (prone or supine), threw up constantly, and had "slow gastric emptying with no obstruction", was continually irritable, often screamed and cried and was inconsolable.

Her previous treatment included: dietary changes (dairy and soy formulas tried, Alimentum and Neonate formulas also did not work), Prilosec, Preacid and Nexium eased her discomfort at night but did not help her eat. She was also put on Reglan for 2 days but had a negative reaction! An endoscopy was performed and rectal polyps were removed. When she entered my office she was taking 20 mg of Nexium per day plus ½ a teaspoon of Miralox once per day. None of her symptoms had responded favorably to the above treatments.

Methods/Intervention:

Using Sacro Occipital Technique (SOT) spinal, cranial and chiropractic manipulative reflex technique (CMRT) adjusting protocols with this patient all of her initial symptoms resolved. Initially, the patient was seen twice per week for 6 weeks at which time an evaluation was done to determine the level of chiropractic care necessary to correct and stabilize her subluxation complex. Due to improvement in both her symptomatic and chiropractic findings her adjustment frequency was reduced to one time per week.

SOT chiropractic adjustments in the initial intensive care period (6 weeks) included correction of: a right occipital compression, an anterior sacrum on the right, viscersomatic correction of T4 rotation and right lateral atlas subluxations. Using SOT pediatric evaluation and adjusting protocols the following visits addressed removing her presenting subluxation pattern and uncovering and correcting her purportedly primary pattern (the initial subluxation that caused the compensatory neurophysiological stresses). These adjustments included some of the aforementioned corrections plus underlying subluxation patterns at: C2, C4, T3 and the left ilium. Supportive CMRT procedures for the gall bladder, lungs, iliocecal area, diaphragm and hyoid bone were utilized when necessary [5]. Cranial corrections were also made based on indicators to the sphenobasilar dural meningeal interrelationship (occiput and sphenoid) [6].

Results:

After the first 3-4 visits the patient's symptoms began to subside, she did not cry in pain as often, her reflux and vomiting reduced dramatically, she no longer needed to take the prescribed medications and she was able to sleep through the night and did not wake up crying in pain. Continued care over the next 2 months mitigated her symptoms dramatically and she suffered only one exacerbation of her vomiting in 3 months.

After 9 visits, 4 weeks of care, Bella started crawling for the first time in her life. While she did begin to walk at 10.5 months her gait was unsteady and her hands were held stiff at her side, even after 2 months of walking. About a week after she began to crawl her gait became smoother and she began to use her hands in the proper cross pattern motion. Her mother also reported that her disposition became much calmer and her emotional outbursts were dramatically reduced. After 3 months of care the patient was able to eat solid food and was to swallow it without throwing up or choking. Bella remained under care for approximately one year with no recurrence of her symptoms at which time her mother decided to discontinue care and "see how she does without it."

Discussion:

This case report is attempting to illustrate how conservative chiropractic care might be effective in the treatment of children with symptoms associated with digestive issues such as GER, HH, and dysphagia. These common pediatric conditions affect the child and the entire family due to the incessant nature of the condition and the complicating factors that

arise from their symptomatology. A recent survey study has found that chiropractic care, and particularly SOT chiropractic care, has been helpful in treatment of pediatric nonmusculoskeletal conditions such as GER or HH [7].

Conservative care for pediatric GER generally includes feeding modifications such as "a protein-hydrolysate formula thickened with one tablespoon of dry rice cereal per ounce, at restricted volumes. Positioning changes included avoidance of seated and supine positions. Elimination of all tobacco smoke exposure was advised [8]." GER is not just a pediatric condition but has been found if untreated to lead to a lifelong disease. Therefore GER may require aggressive therapy early in life to reduce the risk of long-term sequelae [2].

While SOT's CMRT has methods of treating GER [9,10] and HH [11] other chiropractic methods may also offer options for pediatric patients with this condition [12-4]. In a study (n=10) on adult patients with GERD referred by a gastroenterologist for chiropractic co-treatment endoscopy examinations performed after 8 sessions of CMRT chiropractic treatment for gastric syndrome found significant global reduction of GERD symptoms [9].

As with all case studies it is not appropriate to generalize finding of one patient to the whole population at large. This is because case studies do not have controls and comparative studies to rule out confounding conditions such as effects relating to placebos, ideomotor, or regression to a mean. Yet with the difficulty in studying the pediatric population and the lack of clear knowledge with the effect of medications on this group, low risk, and low cost, conservative options are worthy of consideration.

While it is possible that the child might have just outgrown her condition without care, the parents were not satisfied with her progress and the distress this had on both their child and home life. The temporal nature of the care rendered coinciding with the child's ability to eat, sleep and not take medication was remarkable from the standpoints of the doctor and parents. Since the child's condition was stable and on some degree worsening, this change most reasonably seemed related to the care rendered since there were no other variables.

Conclusions:

The findings from this study suggest that a subset of pediatric patients with GER and HH may benefit from SOT, CMRT, and cranial care. With parents who do not want to follow a "wait and see" approach for their children's care a short period of trial therapy which may function as a diagnostic test and a viable option to GER and HH that may be reasonable for gastroesophageal related pain that is unremitting in a young child. Further studies could involve comparative studies with controls or children treated with alternative allopathic care.

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Triple occiput, sacro occipital technique, and chronic fatigue syndrome.
Steven Tupper, DC, Charles L. Blum, DC

Introduction:

Chronic fatigue syndrome (CFS) is the most common name used to specify a disorder or group of disorders generally defined by persistent fatigue accompanied by other specific symptoms for a minimum of six months, not due to ongoing exertion and not substantially relieved by rest [1]. Estimates of CFS prevalence vary widely, from 7 to 3,000 cases of CFS for every 100,000 adults, but national health organizations have estimated more than 1 million Americans and approximately a quarter of a million people in the UK have CFS [2-4]. CFS occurs more often in women than men, and is less prevalent among children and adolescents. The quality of life is "particularly and uniquely disrupted" in CFS [5]. The majority of CFS cases start suddenly, usually accompanied by a "flu-like illness" while a significant proportion of cases begin within several months of severe adverse stress [6].

All ethnic and racial groups appear susceptible to the illness, and lower income groups are slightly more likely to develop CFS [2-5]. A 2009 meta-analysis [7] showed that compared with the White American majority, African Americans and Native Americans have a significantly higher risk of CFS. More women than men get CFS — between 60 and 85% of cases are women; however, there is some indication that the prevalence among men is underreported. The illness is reported to occur more frequently in people between the ages of 40 and 59. CFS is less prevalent among children and adolescents than adults. Blood relatives of people who have CFS appear to be more predisposed and this is believed to be a familial or genetic link but more research is required into all aspects of CFS for definitive answers. No specific treatment has been found successful for CFS and a multidisciplinary team approach is preferred as CFS has both complex presentations and patients may or may not respond to various types of interventions [3-5].

Case Presentation:

48 year old male student presented with chronic fatigue syndrome. He had the condition for years, unresponsive to various interventions, and also had chronic low back discomfort.

Methods and Treatment:

Patient presented with signs of sacroiliac joint laxity with hypermobility (category two) [8] characterized by a positive Milgram's sign with cervical compression test when supine (cervical compaction test). Right iliopsoas tension was noted with a positive left upper inguinal ligament sensitivity on arm fossa test evaluation [9]. Blood pressure was 100/64 sitting and 105/60 supine, cranial nerves were in tack, and deep tendon reflexes were unremarkable except for lack of response on right C5 biceps tendon reflex. Sensitivity

was noted to palpation at C1/2 region. Treatment focused on balancing category two findings and related regions along with upper cervical region.

Results:

The patient reported improvement following treatment, however the relief would not last for more than a few days to a week. During the course of care at infrequent intervals the patient's pelvic torsion would reverse itself and the patient would present with category two findings that would indicate a change in functional leg length when supine. While the patient would have a positive response to treatment there was concern that the relief would not sustain itself and that there was not stabilization of the SI joint position.

A specific occipital adjustment called the "triple occiput" was used which involved adjusting a posterior occiput on one side, then on the contralateral side, and then once again on the ipsilateral side. The initial side was the side of reduced rotation. Following this adjustment the supine pelvic block category two treatment appeared to help stabilize pelvic torsion, facilitate eliminating category two indicators, and improve the patient's long term relief of his chronic fatigue syndrome. The patient was seen at approximately 2 times per month and after the triple occiput adjustment (5 months of treatment) the category two (sacroiliac joint instability) stabilized. The patient was seen once a month for 5 months and at each visit the patient's condition had been stable. Approximately 1-1.5 years the patient has not had symptoms of his prior chronic fatigue syndrome. The patient was last seen 21 March 2011 and previously on 21 February 2011. He reported that his energy levels are still going very well and that he has been able to complete his thesis for his economics doctorate, something he thought he would not be able to do.

Discussion:

There have been limited studies discussing the role of chiropractic care in the treatment of CFS [10]. One study described how patients with fibromyalgia and CFS have been found similar in terms of disability and commonly utilize chiropractic services [11]. It is possible that this patient's sacroiliac joint hypermobility might be related to this patient's CFS since a relationship between joint hypermobility and CFS has been found [12]. Another relationship has been found by Fink et all between the sacroiliac joint, cervical spine, and TMJ which may explain why a treatment to the suboccipital region might help with stabilization of the pelvis [13].

Apparently body posture and the stomatognathic system have a relationship [14] with a specific relationship between the pelvis and TMJ [15]. Another link has been found between the stomatognathic system and cervical spine positioning [16-8] and particularly the occipital region [19] so that the link found by Fink et al [13] could be supported. It is possible that the ability of the visual and vestibular righting mechanisms to "right" themselves to pelvic body posture imbalance leads to increased suboccipital joint tension. When the suboccipital joint reaches a limit where its stress load has been exceeded, at that point a

dysfunctional sacroiliac joint may not be capable of adequately distributing its stress load to secondary regions of the body when necessary.

Conclusion:

A patient with CFS who was unresponsive to prior care had a good response to a unique form of care which involved SOT category two care and an occipital adjustment termed the "triple occiput." Patient with sacroiliac joint hypermobility syndrome with accompanying suboccipital tension may represent a subset of CFS patients that could be responsive to this specific type of chiropractic care. Greater study is needed to evaluate if there is indeed a subset of CSF patients with this pattern and if they are responsive to this form of care.

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Testing an amputee for physiological short leg.

Bruce S. Vaughan, DC, FICC, Charles L. Blum, DC

Introduction:

Physiological leg lengths differ from anatomical leg length differences in that while anatomical leg lengths relate to actual length of the leg bones, the physiological leg lengths relate to leg bones which are the same length but the change is in pelvic dynamics. In a recent study evaluating pelvic torsion and anatomical leg length inequality (LLI) Cooperstein and Lew found that across varying methodologies for measuring anatomical "LLI and pelvic torsion, a consistent, dose-related pattern was identified in which the innominate rotates anteriorly on the side of a an anatomical shorter leg and posteriorly on the side of the longer leg. This finding was contrary to the common assertion that the ilium rotates posteriorly on the side of a short leg and vice versa. Practitioners of manual medicine who derive vectors for intervention based on leg checking procedures should consider the possibility that the direction of pelvic torsion may be variable depending on whether the LLI is of anatomical or functional origin [1]." In other words, the anatomical leg length inequality alters pelvic dynamics, while altered pelvic dynamics causes functional leg length inequality. The cause and effect are opposite in the two situations

While some "studies have been contradictory regarding the relationship of findings of pelvic torsion to pain [2]." Cooperstein and Lisi suggested that "it is reasonable for clinical approaches to take a biomechanical perspective to counter pelvic torsion states [2]." They did a follow up study utilizing pelvic blocks to determine if a patient's pain response would change with pelvic block position. Their study did indeed did find that a preference for block position could be determined in 70% of the test subjects [3]. The assumption from the study was that reducing pelvic torsion with pelvic blocks would have a positive therapeutic effect. What has not been adequately studied is how to evaluate patients for pelvic block position when they may be missing all or part of one leg and the leg length equality cannot be a determining factor. This case report discusses a novel method of evaluating treatment utilizing pelvic blocks for a lower extremity amputee.

Case History:

A 45 year old male patient who had had his left leg amputated ten years previously, as a result of severe injury from a car accident in South Africa, presented with low back pain with buttock and groin pain.

Intervention:

Using Sacro Occipital Technique (SOT) diagnostic methods the patient's condition was consistent with a sacroiliac sprain (category two) [4]. He had pain at the posterior sacroiliac

joint, positive category two findings relating to lateral sway, unilateral rib head tension, and a positive arm fossa test [5]. Due to those findings the patient was to be treated with supine blocking to reduce pelvic torsion and sacroiliac joint instability. However due to the patient not having a left leg to compare to the right side, assessment of pelvic torsion and block placement was a challenge.

Treatment:

Since it would be impossible to determine if the patient had anatomical or physiological leg length imbalance prior to the amputation, a functional tool to assess proper block position was attempted. Muscle testing was used as a functional assessment tool and a pre test had found that grasping the patient's leg and testing the arm for strength, showed weakness when one leg was forced shorter, or the other leg was forced longer. This pattern was believed to accentuate pelvic torsion and pelvic blocks were placed according to this arrangement.

Results:

The patient responded well to category two block placement with reduced pain, improved function and reduction of SOT indictors of a sacroiliac joint sprain.

Discussion:

Testing seated posterior superior iliac spines (PSIS) may offer a method of dealing with patients where a landmark is preferred for block placement of patients missing one or both legs. Cooperstein et al used a direct approach of sitting PSIS palpation to identify pelvic torsion, rather than the more typically used and indirect approach of leg checking. This study successfully found that blocking preferences related to pelvic torsional patterns could be assessed by PSIS palpation [6]. While PSIS palpation could be analyzed for block position a functional assessment should also be added, such as muscle testing to test muscles whilst challenging the two leg lengths by forcing one longer or shorter while assessing changes.

Future study could evaluate provocation testing of the pelvic with blocks in place and without, to determine if there could be increased pain or improvement of muscle function [7]. However the ease of forcing the leg longer or shorter and assessing muscle strength offers a good orthopedic assessment tool to guide appropriate pre and post treatment response. Block placement can also be guided by utilizing a reduction in the arm fossa test, sensitivity at the inguinal ligaments or medial lateral knee points, as well as at the 1st rib head region [8].

Conclusion:

Evaluating patients who may have had lower extremity amputations can commonly lead to treatment difficulties when attempting to determine pelvic torsion analysis utilizing leg length. In this study a method of "forcing" the leg longer or shorter and assessing muscle strength was used to determine proper supine pelvic block placement to successfully treat a sacroiliac joint sprain (category two). Further research is needed to determine if this method of analysis is possible in conjunction with the seated PSIS assessment by Cooperstein, to aid in the treatment of patients with lower extremity amputations.

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Nighttime Biofeedback as a Tool for the Reduction of Habitual Bruxism Activity and Related TMD Symptoms.

Lee Weinstein

Introduction:

The National Institutes of Health estimates that 10.8 million people suffer from temporomandibular disorders (TMD) in the United States, and 90 percent of those sufferers are women in child-bearing years. In a recent study done at Tufts involving 504 TMD patients, about 70% of patients self-reported that they attributed their TMD symptoms to bruxism [1]. It has long been known that bruxism is one of the main causes of TMD, but until the recent advent of wearable, quantitative EMG measurement equipment, it had been difficult to measure the correlation between various TMD symptoms and the quantity of bruxism that a patient exhibits. The advent of the first EMG measurement headband in 2001 made quantitative assessment of bruxism easy and economical.

One of the most challenging things about bruxism to both patients and clinicians is that in many cases even if the initial cause of bruxism can be identified and eliminated, the bruxism behavior may have become habitual and thus the behavior may not be eliminated by the elimination of the cause. The habitual nature of bruxism is one of the reasons that all treatment modalities to date (including splints, drugs, Botox, chiropractic techniques, acupuncture, etc.) have achieved only limited success. In a survey of 300 habitual bruxers conducted through Google [2], patients rated none of these treatment modalities - highly effective more than 15% of the time.

There has been a large body of research to support the use of biofeedback to aid in treatment of TMD pain [3], with dental cotreatment [4-10], for temporomandibular joint (TMJ) muscle tension [11-15], and bruxism [16,17]. These studies utilized tabletop biofeedback units that were connected to the patient with wired adhesive electrodes.

In this study patients provided with a self-contained biofeedback headband which was worn at night to provide biofeedback during sleep. We examine the efficacy of nighttime biofeedbacknighttime use of the biofeedback headband in the reduction or elimination of habitual bruxism. Efficacy was measured through quantitative EMG measurements made during sleep. Many patients who participated in this study additionally self-reported reduction or elimination of symptoms., the basis of this report is the quantitative EMG measurements.

Therapeutic Intervention:

The SleepGuard biofeedback headband (shown below) is a self-contained biofeedback device worn on the head, which measures electromyographic signals (EMG) from the temporalis muscles. No adhesive electrodes are required.

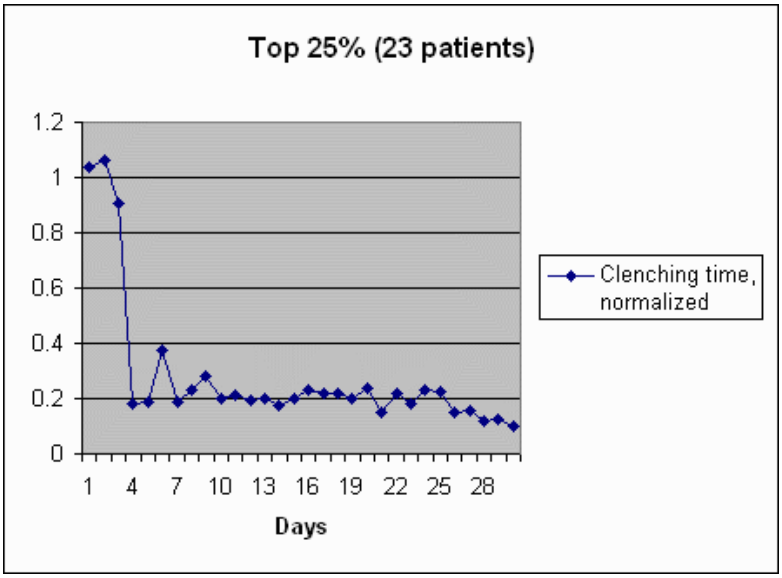
The headband can be worn either in silent mode (to measure baseline bruxism) or in biofeedback mode. In both modes it measures two things over the course of a night: a count of bruxism events, and the total accumulated clenching time of those bruxism events. It also includes a piezoelectric tone generator that contacts the forehead and can produce an acoustic biofeedback tone, which is heard through bone conduction in both ears. The tone starts at a low volume when clenching starts, and ramps up in volume as clenching continues. As soon as clenching stops, the tone stops.

Clinical Trial Results

The first round of clinical trials to test the efficacy of using a biofeedback headband to reduce bruxism was completed on October 10, 2010. There were 92 patients in the trial. The total clenching time recorded by the biofeedback headband each night was logged on a daily basis. The first three days of data for each participant were baseline data. The remaining 27 days of data were data taken with the biofeedback turned on. Running the data through a statistical analysis package yielded a p value for the data of 0.0000000000000002.

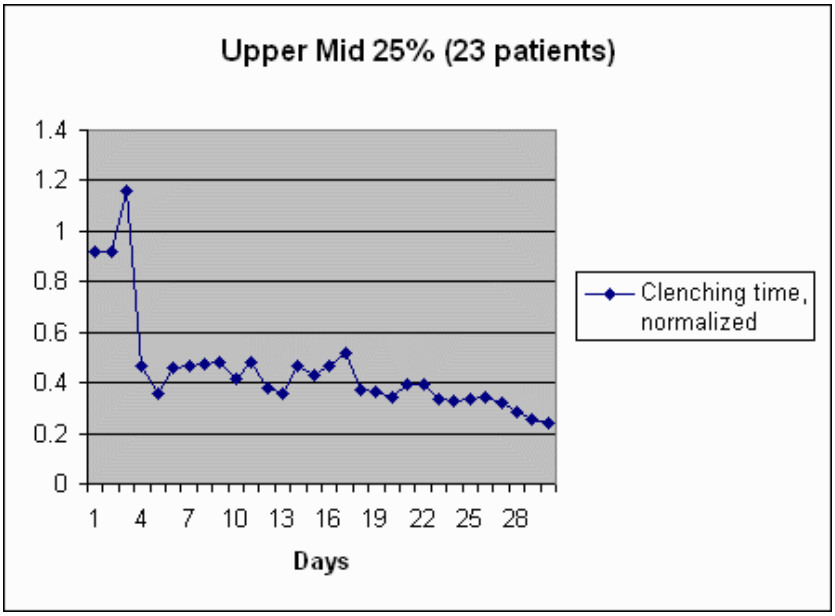
One illuminating way to view the data is to divide the clinical trial patients into four groups (quartiles), ranked by overall end reduction in nightly bruxism at the end of the trial versus the beginning. The four graphs below represent efficacy quartiles (23 patients each, with each graph representing the average of the normalized data from the 23 patients in the quartile). The most responsive quartile is shown first and the least responsive quartile is shown last. Average nightly reduction in bruxism time was measured as the difference between the normalized average nightly clenching time during the three days of initial baseline measurement (this average was normalized to 1 for all patients), and the normalized average nightly clenching time during the last three days of the trial.

The best performing quartile (23 patients) results are shown below.



These patients showed an average initial reduction in bruxism time of 80% in one day after turning on the biofeedback, and by the end of the month they had a nightly bruxism time reduction of 90%. Also taking into account the probable average reduction of clenching force of 50% to 90%, gives a probable 95% to 99% reduction in nightly damage. Most patients in this quartile report substantial reduction or complete elimination of pain such as jaw pain, migraines, TMJ pain, etc..

The next best performing quartile (23 patients) is shown below.

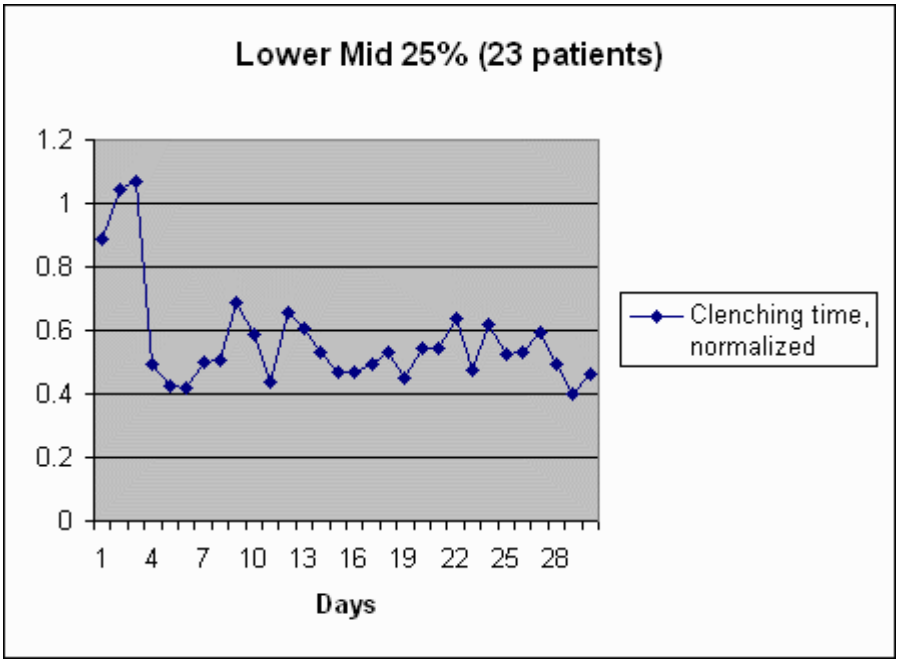


These patients' "remaining bruxism" is about twice the top group, but still very low.

As can be seen in both of the upper quartiles above, nightly clenching time was trending down steadily toward the end of the month, perhaps indicating that these patients are on the average training themselves out of their bruxism habit. This theory is supported by anecdotal evidence in follow-up interviews several months later, where a number of patients said that after using the biofeedback for between two and four months, they were able to go for long periods (over a month) without using the headband before any daily pain returned.

Most patients in this second quartile, like the first quartile, report substantial reduction or complete elimination of pain such as jaw pain, migraines, TMJ pain, etc..

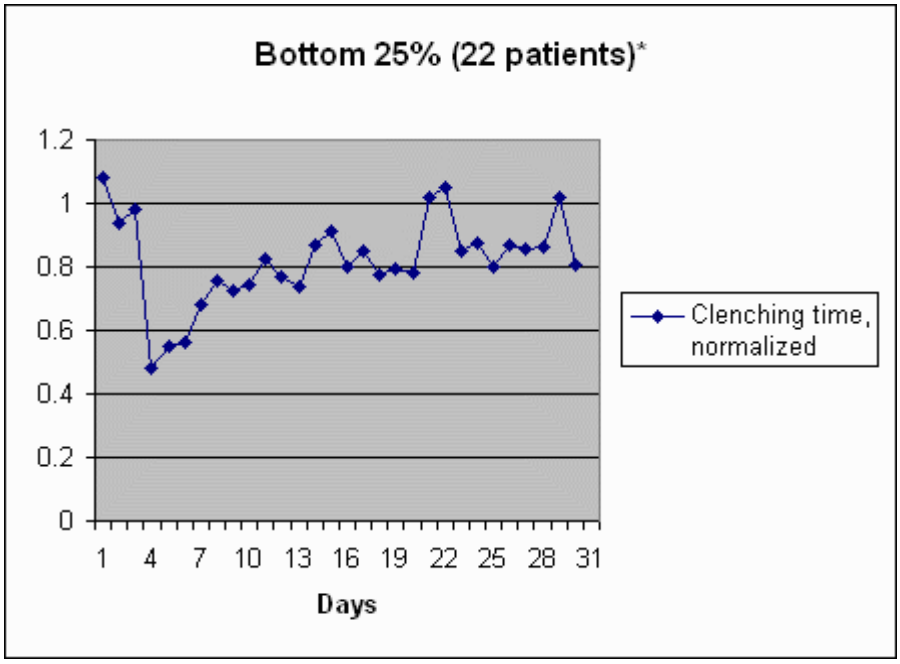
The average of the data from the lower mid quartile (23 patients) is shown below.



These patients experience approximately a 60% initial reduction in nightly clenching time when the biofeedback is turned on, and their nightly clenching times remain at roughly this level for the rest of the month. In addition to the reduction in clenching time, it is estimated that this group experiences a reduction in clenching force by about 50%.

There is no obvious trending downward toward the end of the month for this group, so there is no evidence that they are training themselves out of their bruxism habit, but continued use of the biofeedback appears to be a viable tool in ongoing mitigation of bruxism damage and pain. Some patients in this quartile reported a complete elimination of pain symptoms, including TMJ pain and migraines.

The data from the worst-performing quartile (excluding one outlier, whose data is included in the whole group average) is shown below.



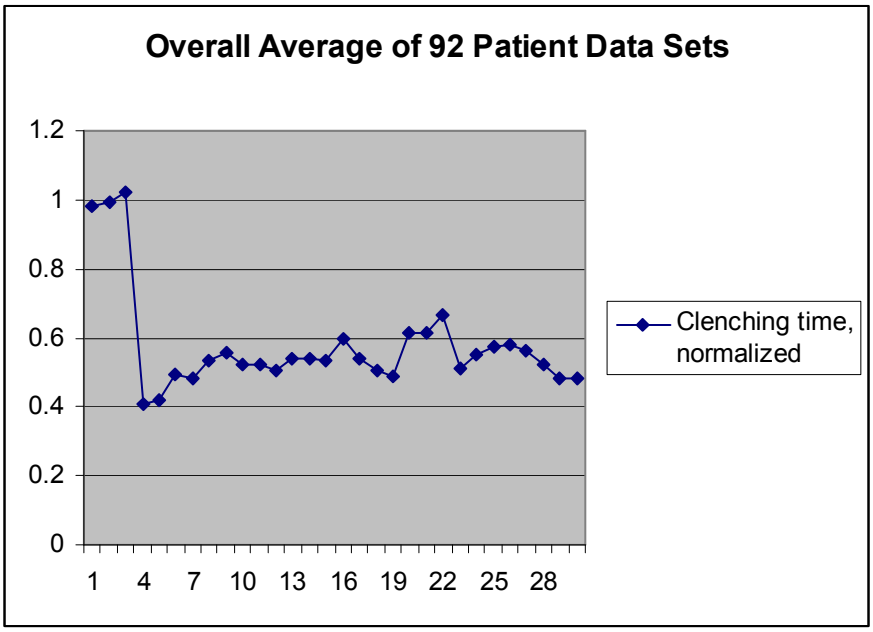
These patients respond well to the biofeedback at first, and then over time, their nightly bruxism times came back to a level close to their baseline levels.

One way to interpret why this may happen is that each person may be thought of as being of "two minds". One part of the mind wants to learn to relax and end the bruxism habit. This part of the mind hears the biofeedback tone as a caring reminder about something important.

The other part of the mind wants to learn to ignore any sound heard during sleep. For this group, this second part of the mind appears to win out, and patients return to near-baseline levels of clenching (though there is some reduction in clenching time and some reduction in clenching force, so they still benefit).

A follow-on study is under way with the majority of patients in the lower quartile. In the follow-on study, the biofeedback headbands given to these patients have been equipped with earphones which enable the biofeedback sound to be adjusted to a significantly louder level. The theory here is that when the sound is louder, the part of the mind that wants to sleep through everything will have less chance to succeed, and the part of the mind that wants to respond by learning to relax rather than clench will have more of a chance to succeed. Initial results of this follow-on study indicate that with a louder biofeedback sound, the majority of patients in the last quartile move into one of the first three quartiles.

Averaging the data from all 92 patients in the clinical trial, the overall average clenching time graph is shown below.



As can be seen by comparing the "overall average" graph above to the four quartile graphs, the overall average is only representative of a small percentage of people in the trial.

Discussion:

To place the results of this study in proper context it is important to understand the neurological nature of habit formation and habit modification and their relationship to biofeedback and bruxism. Below we will first present a modern neurological model of habit formation and modification, which form the basis for the design of this study. After that premise is shared, we will discuss other treatments and how they fit within this neurological model of habit formation and modification. We will then present key differences between nighttime biofeedback and daytime biofeedback in the treatment of nighttime bruxism.

The Habitual Nature of Bruxism

How nighttime clenching becomes a habit

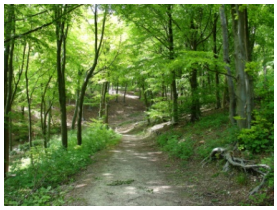
Lets take a look at how we human beings build habits. One of the key functions of the neocortex (the part of the brain that makes humans different from animals) is the formation and execution of habits. Habits enable us to do many things subconsciously and simultaneously, while our conscious attention can only handle doing one or two things. Recent brain research [18] has shown that the basic function of the neocortex is to

memorize, recognize, predict, and replay patterns. Habit formation and the triggering of habitual actions (such as stepping on the brake when the brake lights of a car in front of you go on) are subsets of these basic cortex functions of memorizing, recognizing, predicting, and replaying patterns.

We survive by building thousands of such "good" habits, all of which are triggered by associated feelings or situations. Once a recognition sequence (of a feeling or situation) and the appropriate response action sequence have been learned, that recognition and those responses can (and do) become subconscious, in that the recognition of circumstances and the acting out of the response both happen without us thinking about it. There are many such recognition and action sequences involved in being able to do something like play a sport, or drive a car. Once a given recognition neuron has been wired up to trigger an action sequence neuron, it takes non-trivial re-training to prevent that triggering from happening, or to mitigate the action once it has been initiated. The perception patterns we learn to recognize to trigger a motor sequence (habit) can include all our senses, plus emotional states, plus imagined situations and emotions.

When we learn a habit such as bruxism, both an action sequence (clenching), and the resulting sensation sequence are stored in our brains through repetition, in the form of strengthened neural connections, and later either imagining the sensation sequence or something associated with it (or experiencing an associated emotion) can trigger the action subconsciously.

As we first develop a habit where there is no initial tendency, the (non-conscious) neural pathway from sensation sequence to desired action sequence could be thought of as a meandering pathway (sequence of neurons that fire) through an un-cut jungle to a destination (an action).



For habits where there is an initial tendency, a jungle with a path through it may be a better initial analogy.

Each time a particular neural pathway gets used, it gets strengthened. This happens physically at the synapses between neurons. So as the habit gets more entrenched, that path through the jungle may begin to look more like a road (which is easier to go down than a path).

When the habit becomes still more entrenched, it may look more like a highway.

The structure of breaking a habit

If we have a habit (a neural highway toward a particular action sequence such as bruxism) and we want to stop using that highway for a while, so it can become "overgrown with trees and look more like a jungle,." hHow might this be accomplished?

With habits like fingernail biting or thumb-sucking, the answer may seem obvious. A way to change the habit is to develop awareness of the onset of the behavior, and then substitute a different behavior. Repeated conscious intervention is the key to modifying any habit. But how can a habit be modified if it occurs during sleep?

The key to modifying a habit that occurs during sleep is to provide some level of conscious awareness of the onset of the habitual action, so the sleeping person can substitute a different action sequence. Nighttime biofeedback can provide a signal at the onset of an action but a challenge has been how to recognize and respond to such a signal when sleeping. Most parents will realize through their own experience that if they hear a sound in the house that could indicate his or her child is in danger, the parent will usually suddenly awake. This sudden awakening happens when a subconscious process in the cortex recognizes (for instance) a sound sequence that could indicate a child is in danger. If a signal is recognized during sleep this signal could be effectively used to change a habit, particularly if it can occur without awakening the patient.

Bruxism Habit Formation

Some The stages of habit formation as they relate to bruxism could be portrayed modeled as follows:

1) Neurologically Intense Thought/Emotion ----------> Initial Action
   (for instance stress, traumatic memory of car accident, allergic reaction to a food, or reaction to a drug)
   (Clenching and/or grinding of teeth)

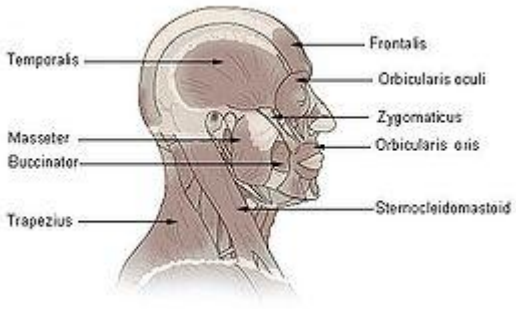
2) Action Sequence (in presence of thought/emotion) ------> Nerve Sensation Sequence from teeth
   Clench with force ramping up, then stop

3) Thought/Emotion -> Predictive memory of sequence -> Habitual Muscle/Sensation sequence

While in the beginning it may be take an exceptional circumstance, (such as a traumatic event, or a very stressful period of time, or a drug or nutritional situation that throws the patient's system into imbalance), and results in to trigger bruxism,. Oonce bruxism becomes a habit, it only takes a subconscious memory to trigger the previously memorized bruxism action sequence in sleep. As the bruxism happens, neural associations are built between emotions, physical sensations, and muscle actions. Additionally, memories are formed of those emotional states and physical sensations, and later recalling of those memories can trigger the associated muscle action sequences.

Detecting and Interrupting Bruxism

The muscles involved in typical bruxism are the temporalis and masseter muscle groups. Typically these two muscle groups fire together during normal chewing and bruxism. There are exceptions to this, but those exceptions are relatively uncommon.



Increasing Probability of Efficacy through Daytime Pavlovian Conditioning

About a year after the biofeedback headband first became available, interviews were conducted with 100 patients who had used the headband for bruxism reduction for at least a couple of months. Anecdotal reports from those interviews indicated that patients who spent wakeful time training themselves to relax when they heard the biofeedback tone did better than patients who did not. Thus within the clinical trial presented herein, all participants were instructed to spend at least a few minutes per day in the first few days doing "Pavlovian training," to train themselves to relax when the tone was heard. The intent is for this training to carry over into sleep, and increase the patient's ability to respond (by relaxing his or her jaw) in sleep without waking when the biofeedback tone is heard.

Conclusion:

This clinical trial showed that about 75 percent of patients are able to reduce their nightly clenching substantially through ongoing use of the biofeedback headband. On the average, the bulk of the benefit in nightly clenching time reduction is realized from the day the biofeedback is turned on. Reduction in pain or elimination of pain usually follows within several days. About 25% of patients appear to remain at the initially-reduced level ongoingly, and there are indications that about 50% of patients are able to continue to steadily reduce their nightly clenching times beyond the initial reduction. Future research will include a follow up trial that is 60 days long instead of 30 days long, and includes 3-day baseline measurements after 27 days and after 57 days, as well as at the beginning of the trial. Another clinical trial is being designed for a migraine reduction study to be run by a neurologist in Buffalo, New York. Other partnering opportunities for future clinical trials are currently being explored.

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Effective Scientific Posters: Quick Reference

George R. Hess
[http://www.ncsu.edu/project/posters/NewSite/documents/QuickReferenceV2.pdf]

A poster is a visual communication tool.

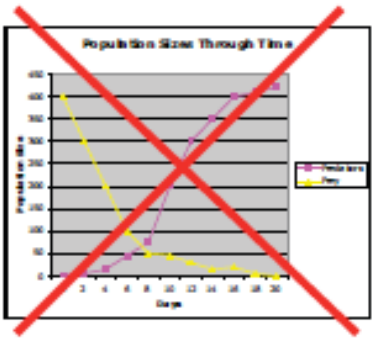
An effective poster will help you …
… engage colleagues in conversation.
… get your main points across to as many people as possible.

Posters serve as …
» a source of information
» a conversation starter
» a summary of your work
» an advertisement of your work

Tips for Effective Poster Presentations

- Get your message across with effective visual displays of data and small blocks of supporting text. Think of your poster as an illustrated abstract.
- Tell readers why your work matters, what you did, what you found, and what you recommend. Avoid excessive focus on methods – it's the results and implications that count!
- Overall appearance. Use a pleasing arrangement of graphics, text, colors. Your poster should be neat and uncluttered – use white space to help organize sections. Balance the placement of text and figures.
- Organization. Use headings to help readers find what they're looking for: objective, results, conclusions, etc. A columnar format helps traffic flow in a crowded poster session.
- Minimize text – use graphics. Keep text in blocks of no more than 50-75 words – don't create large, monolithic paragraphs of prose.
- Text size. All text should be large enough to read from 1-2 meters, including the text in figures. Title should be larger, to attract attention from far away.
- Use color cautiously. Dark letters on light background are easiest to read. Stick to a theme of 2-3 colors. Avoid overly bright colors – they attract attention but wear out reader's eyes.
- Don't fight reader gravity, which pulls the eyes from top to bottom (first), and left to right.
- Include full contact information. You want to be found – the reader should not have to look up anything to find you.

Clean graphs show data clearly!



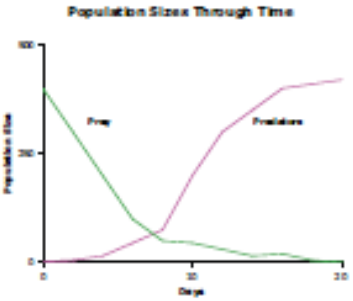
Desired message: Prey decreased as predators increased. Focus on relationships – exact values are usually not important.

Eliminate "chart junk" to keep focus on data. Grid lines, detailed ticks on axes, data markers, and grey backgrounds are not needed.

Label data directly, when possible.

Legends force reader to look back and forth to decode graph.

Message is now loud and clear!



Sample Case Report Poster Presentation

Names of Authors and Affiliations

INTRODUCTION

In the introduction section you describe the purpose of your poster presentation. Describe the importance of the topic, why the reader should bother to read this poster, and briefly summarize the poster's focus.

CASE REPORT INFORMATION

This is the place where you share the patient's gender, age, and any pertinent information. Why did they come to you for treatment, is there any unusual information about this patient, and any prior or current treatment they received?

INTERVENTION/TREATMENT

What treatment did the patient receive at your clinic? How long and how many treatments were rendered? Were any unusual tests performed and did they guide treatment?

RESULTS

What was the patient's response to your treatment? Can you objectively quantify their response with outcome assessment pre and post forms? Were there pre and post laboratory, imaging, or other type of findings?

A brief caption under a picture is helpful.

DISCUSSION

Can you give a research or "evidence" basis for why you think your treatment had the purported effect on the patient discussed in this poster?

DISCUSSION (Continued)

Why do you think that the patient would not have gotten better on their own without treatment or that some other treatment they received was not the reason for their response to care? What are the limitations to your study?

CONCLUSION

Summarize your whole poster in a sentence. How could future studies be improved and how is this one a call for further research?

REFERENCES

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Location and Date to be Announced