2014

Proceedings of the 6th Sacro Occipital Technique Research Conference

Redondo Beach, California

May 15, 2014

Sacro Occipital Technique Research Conference

Redondo Beach, California
May 15, 2014

Hosted by:

Sacro Occipital Technique Organization – USA

CONFERENCE PROCEEDINGS

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Proceedings of the Sacro Occipital Technique Research Conference

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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]."

> "*Research in Chiropractic must go on forever. Someone must do this type work, for it simply will not take care of itself. A profession cannot stand still. Momentum must constantly be generated. Chiropractic research needs many things it does not now have* [4]."""*Sacro Occipital Technic, like all Chiropractic Technics, needs further study. We certainly do not have all the answers to all of man's problems, and neither does any other group of people* [4]."

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.

3. DeJarnette MB. **The Sacro Occipital Technique Bulletin**. Mar 1978: 2-3.

4. DeJarnette MB. **The History of Sacro Occipital Technic**. Private Practice: Nebraska City, NB. 1958:27.

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 decision 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 exaggerated 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 voices 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.

What is plagiarism?

First published on the University of Oxford Student Gateway website. Reproduced with the permission of the Chancellor, Master and Scholars of the University of Oxford. [http://www.myofunctional-therapy.com/courses.html] Last accessed April 22, 2013.

What is plagiarism?

Plagiarism is the copying or paraphrasing of other people's work or ideas into your own work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition. Collusion is another form of plagiarism involving the unauthorized collaboration of students (or others) in a piece of work.

Why does plagiarism matter?

Plagiarism is a breach of academic integrity. It is a principle of intellectual honesty that all members of the academic community should acknowledge their debt to the originators of the ideas, words, and data, which form the basis for their own work. Passing off another's work as your own is not only poor scholarship, but also means that you have failed to complete the learning process. Deliberate plagiarism is unethical and can have serious consequences for your future career; it also undermines the standards of your institution and of the degrees it issues.

Why should you avoid plagiarism?

There are many reasons to avoid plagiarism. You have come to university to learn to know and speak your own mind, not merely to parrot the opinions of others - at least not without attribution. At first it may seem very difficult to develop your own views, and you will probably find yourself paraphrasing the writings of others as you attempt to understand and assimilate their arguments. However it is important that you learn to develop your own voice. You are not necessarily expected to become an original thinker, but you are expected to be an independent one - by learning to assess critically the work of others, weigh up differing arguments and draw your own conclusions. Students who plagiarize undermine the ethos of academic scholarship while avoiding an essential part of the learning process.

You should not avoid plagiarism for fear of disciplinary consequences, but because you aspire to produce work of the highest quality. Once you have grasped the principles of source use and citation, you should find it relatively straightforward to steer clear of plagiarism. Moreover, you will reap the additional benefits of improvements to both the lucidity and quality of your writing. It is important to appreciate that mastery of the techniques of academic writing is not merely a practical skill, but one that lends both credibility and authority to your work, and demonstrates your commitment to the principle of intellectual honesty in scholarship.

What to avoid

The necessity to reference applies not only to text, but also to other media, such as computer code, illustrations, graphs etc. It applies equally to published text drawn from books and journals, and to unpublished text, whether from lecture handouts, theses or other students'

essays. You must also attribute text or other resources downloaded from web sites. An example of plagiarism has also been set out to illustrate how to avoid plagiarism.

There are various forms of plagiarism and it is worth clarifying the ways in which it is possible to plagiarize:

Verbatim quotation without clear acknowledgement

Quotations must always be identified as such by the use of either quotation marks or indentation, with adequate citation. It must always be apparent to the reader which parts is your own independent work and where you have drawn on someone else's ideas and language.

Paraphrasing

Paraphrasing the work of others by altering a few words and changing their order or by closely following the structure of their argument, is plagiarism because you are deriving your words and ideas from their work without giving due acknowledgement. Even if you include a reference to the original author in your own text you are still creating a misleading impression that the paraphrased wording is entirely your own. It is better to write a brief summary of the author's overall argument in your own words than to paraphrase particular sections of his or her writing. This will ensure you have a genuine grasp of the argument and will avoid the difficulty of paraphrasing without plagiarizing. You must also properly attribute all material you derive from lectures.

Cutting and pasting from the Internet

Information derived from the Internet must be adequately referenced and included in the bibliography. It is important to evaluate carefully all material found on the Internet, as it is less likely to have been through the same process of scholarly peer review as published sources.

Inaccurate citation

It is important to cite correctly, according to the conventions of your discipline. Additionally, you should not include anything in a footnote or bibliography that you have not actually consulted. If you cannot gain access to a primary source you must make it clear in your citation that your knowledge of the work has been derived from a secondary text (e.g. Bradshaw, D. Title of Book, discussed in Wilson, E., Title of Book (London, 2004), p. 189).

Failure to acknowledge

You must clearly acknowledge all assistance which has contributed to the production of your work, such as advice from fellow students, laboratory technicians, and other external sources. This need not apply to the assistance provided by your tutor or supervisor, or to ordinary proofreading, but it is necessary to acknowledge other guidance which leads to substantive changes of content or approach.

Professional agencies

You should neither make use of professional agencies in the production of your work nor submit material which has been written for you. It is vital to your intellectual training and development that you should undertake the research process unaided.

Does this mean that I shouldn't use the work of other authors?

On the contrary, it is vital that you situate your writing within the intellectual debates of your discipline. Academic essays almost always involve the use and discussion of material written by others, and, with due acknowledgement and proper referencing, this is clearly distinguishable from plagiarism. The knowledge in your discipline has developed cumulatively as a result of years of research, innovation and debate. You need to give credit to the authors of the ideas and observations you cite. Not only does this accord recognition to their labors, it also helps you to strengthen your argument by making clear the basis on which you make it. Moreover, good citation practice gives your reader the opportunity to follow up your references, or check the validity of your interpretation.

Does every statement in my essay have to be backed up with references?

You may feel that including the citation for every point you make will interrupt the flow of your essay and make it look very unoriginal. At least initially, this may sometimes be inevitable. However, by employing good citation practice from the start, you will learn to avoid errors such as sloppy paraphrasing or unreferenced quotation. It is important to understand the reasons behind the need for transparency of source use. All academic texts, even student essays, are multi-voiced, which means they are filled with references to other texts. Rather than attempting to synthesize these voices into one narrative account, you should make it clear whose interpretation or argument you are employing at any one time (whose 'voice' is speaking). If you are substantially indebted to a particular argument in the formulation of your own, you should make this clear both in footnotes and in the body of your text, before going on to describe how your own views develop or diverge from this influence. On the other hand, it is not necessary to give references for facts that are common knowledge in your discipline. If you are unsure as to whether something is considered to be common knowledge or not, it is safer to cite it anyway and seek clarification. You do need to document facts that are not generally known and ideas that are interpretations of facts.

Examples of plagiarism

The following examples demonstrate some of the common pitfalls to avoid; they should be of use even to non-historians. However, you should consult your subject handbook and course tutor for specific advice relevant to your discipline. The referencing system used here is that prescribed by the History Faculty for the use of writers of theses.

Source text

From a class perspective this put them [highwaymen] in an ambivalent position. In aspiring to that proud, if temporary, status of 'Gentleman of the Road', they did not question the inegalitarian hierarchy of their society. Yet their boldness of act and deed, in putting them outside the law as rebellious fugitives, revivified the 'animal spirits' of capitalism and

became an essential part of the oppositional culture of working-class London, a serious obstacle to the formation of a tractable, obedient labour force. Therefore, it was not enough to hang them – the values they espoused or represented had to be challenged.

(Linebaugh, P., The London Hanged: Crime and Civil Society in the Eighteenth Century (London, 1991), p. 213. [You should give the reference in full the first time you use it in a footnote; thereafter it is acceptable to use an abbreviated version, e.g. Linebaugh, The London Hanged, p. 213.]

Plagiarized

1. Although they did not question the inegalitarian hierarchy of their society, highwaymen became an essential part of the oppositional culture of working-class London, posing a serious threat to the formation of a biddable labour force. (This is a patchwork of phrases copied verbatim from the source, with just a few words changed here and there. There is no reference to the original author and no indication that these words are not the writer's own.)

2. Although they did not question the inegalitarian hierarchy of their society, highwaymen exercised a powerful attraction for the working classes. Some historians believe that this hindered the development of a submissive workforce. (This is a mixture of verbatim copying and acceptable paraphrase. Although only one phrase has been copied from the source, this would still count as plagiarism. The idea expressed in the first sentence has not been attributed at all, and the reference to 'some historians' in the second is insufficient. The writer should use clear referencing to acknowledge all ideas taken from other people's work.)

3. Although they did not question the inegalitarian hierarchy of their society, highwaymen 'became an essential part of the oppositional culture of working-class London [and] a serious obstacle to the formation of a tractable, obedient labour force'.[1] (This contains a mixture of attributed and unattributed quotation, which suggests to the reader that the first line is original to this writer. All quoted material must be enclosed in quotation marks and adequately referenced.)

4. Highwaymen's bold deeds 'revivified the "animal spirits" of capitalism' and made them an essential part of the oppositional culture of working-class London.[1] Peter Linebaugh argues that they posed a major obstacle to the formation of an obedient labour force. (Although the most striking phrase has been placed within quotation marks and correctly referenced, and the original author is referred to in the text, there has been a great deal of unacknowledged borrowing. This should have been put into the writer's own words instead.)

5. By aspiring to the title of 'Gentleman of the Road', highwaymen did not challenge the unfair taxonomy of their society. Yet their daring exploits made them into outlaws and inspired the antagonistic culture of labouring London, forming a grave impediment to the development of a submissive workforce. Ultimately, hanging them was insufficient – the ideals they personified had to be discredited.[1] (This may seem acceptable on a superficial level, but by imitating exactly the structure of the original passage and using synonyms for almost every word, the writer has paraphrased too closely. The reference to the original author does not make it clear how extensive the

borrowing has been. Instead, the writer should try to express the argument in his or her own words, rather than relying on a 'translation' of the original.)

Non-plagiarized

1. Peter Linebaugh argues that although highwaymen posed no overt challenge to social orthodoxy – they aspired to be known as 'Gentlemen of the Road' – they were often seen as anti-hero role models by the unruly working classes. He concludes that they were executed not only for their criminal acts, but in order to stamp out the threat of insubordinacy.[1] (This paraphrase of the passage is acceptable as the wording and structure demonstrate the reader's interpretation of the passage and do not follow the original too closely. The source of the ideas under discussion has been properly attributed in both textual and footnote references.)

2. Peter Linebaugh argues that highwaymen represented a powerful challenge to the mores of capitalist society and inspired the rebelliousness of London's working class.[1] (This is a brief summary of the argument with appropriate attribution.)

[1] Linebaugh, P., The London Hanged: Crime and Civil Society in the Eighteenth Century (London, 1991), p. 213.

2014 SOT Research Conference Schedule

May 15, 2014 · Redondo Beach, California

1:00 – 1:50 PM	**TMJ, Post-Concussion, and Occipital Fibers**
	Dental-Cranial functional model and the understanding of cranial facial distortions in dentistry: A Commentary. *Richard C. Gerardo, DC*
	Post concussion syndrome, temporomandibular joint disorders, and chiropractic dental co-treatment: A case report. *Thomas E. Bloink, DC*
	Sacro Occipital Technique: Palpating Occipital Fibers on Animals – A Pilot Study. *Jean E. Thompson, DC*
2:00 – 2:50 PM	**Viscerosomatic, Spondylotherapy, and SOT Cervical Care**
	Gastroesophageal reflux disease (GERD) and sacro occipital technique (SOT) chiropractic: A case report. *Harvey Getzoff, DC*
	The influence of the chiropractic treatment in patients with insulin resistance associated with diabetes type 2: A case series. *Fabio dal Bello, MS, DC*
	Intervention in menorrahagia through chiropractic adjustment and spondylotherapy: A case report. *William J. Boro, DC*
	Sacro occipital technique (SOT) cervical protocol: analysis, adjustment and assessment: A retrospective case series [n=48]. *Harvey Getzoff DC*
3:10 – 4:00 PM	**Arm Fossa Test, Blocking Preferences, and the Short Leg**
	The correlation of the Arm-Fossa Test with other sacroiliac findings: A feasibility study. *Robert Cooperstein, MA, DC*
	Sitting PSIS positions and prone blocking preferences: A preliminary report. *Robert Cooperstein, MA, DC*
	The short leg question in chiropractic: Qualitative clinical research on the significance of the type of "short leg" *Robert Cooperstein, MA, DC*

4:10 – 5:00 PM	**TMJ, Preventative Care, Table Sanitization, and STO**
	Is it Mental or is it Dental? Cranial & Dental Impacts on Total Health: A Commentary. *Raymond Silkman, DDS*
	Chiropractic – preventative and wholistic care: Two representative case reports. *Michael Kooby, DC*
	Chiropractic table sanitization and aqueous ozone as an effective green alternative: A proposed research study. *Beth Dominicis, DC*
	The history of temporal sphenoidal (TS) diagnosis and its clinical applications. *Kenneth Y. Davis, DC*

Alexander Technique: An introduction with some evidence based literature.
Charles L. Blum, DC

Introduction

In the 15th Annual Sacro Occipital Technique Organization – USA Symposium, Alexander Technique will be introduced as part of an interdisciplinary approach to care. Since the Alexander Technique has not been readily shared within the chiropractic profession, it is important to review the Alexander Technique's evolving evidence base. This technique is being introduced in the dental chiropractic TMJ co-treatment section of the symposium due to the Alexander Technique's novel way of addressing forward head posture and its associated whole body effects[1]. The following description of the Alexander Technique is from the technique's website [http://www.alexandertechnique.com][2].

> "The Alexander Technique is a way of learning to move mindfully through life. The Alexander process shines a light on inefficient habits of movement and patterns of accumulated tension, which interferes with our innate ability to move easily and according to how we are designed. It's a simple yet powerful approach that offers the opportunity to take charge of one's own learning and healing process, because it's not a series of passive treatments but an active exploration that changes the way one thinks and responds in activity. It produces a skill set that can be applied in every situation. Lessons leave one feeling lighter, freer, and more grounded[2]."
>
> "The Alexander Technique is a method that works to change (movement) habits in our everyday activities. It is a simple and practical method for improving ease and freedom of movement, balance, support and coordination. The technique teaches the use of the appropriate amount of effort for a particular activity, giving you more energy for all your activities. It is not a series of treatments or exercises, but rather a reeducation of the mind and body. The Alexander Technique is a method which helps a person discover a new balance in the body by releasing unnecessary tension. It can be applied to sitting, lying down, standing, walking, lifting, and other daily activities...[2]"

Development of an Evidence Base

While there are various research studies[3-33] studying Alexander Technique (AT), the following are a few of the most recent which are helping to build an evidence base of information.

Low Back Pain

A factorial randomized trial by Little et al, was performed to determine the effectiveness of lessons in the Alexander technique, massage therapy, and advice from a doctor to take exercise (exercise prescription) along with nurse delivered behavioural counselling for patients with chronic or recurrent back pain. Utilizing 579 patients with chronic or recurrent low back pain from 64 general practices in England, 144 were randomized to normal care, 147 to massage, 144 to six Alexander technique lessons, and 144 to 24 Alexander technique lessons; half of each of these groups were randomized to exercise prescription

As a means to evaluate chronic low back pain and dysfunction Roland Morris disability scores (number of activities impaired by pain) and number of days in pain were assessed. The study concluded that "one to one lessons in the Alexander technique from registered teachers have long term benefits for patients with chronic back pain. Six lessons followed by exercise prescription were nearly as effective as 24 lessons[15]."

Gurfinkel, Presecrtip and colleagues[34] recently found that healthy adults dynamically modulate postural muscle tone in the body axis during anti-gravity postural maintenance, and that this modulation is inversely correlated with axial stiffness. The objective of the study was to investigate whether dynamic modulation of axial postural tone can change through training. Cacciatore et al examined whether teachers of the AT, who undergo "long-term" (3-year) training, have greater modulation of axial postural tone than matched control subjects. In addition, they performed a longitudinal study on the effect of "short-term" (10-week) AT training on the axial postural tone of individuals with low back pain (LBP), since short term AT training has previously been shown to reduce LBP[35]. Axial postural tone was quantified by measuring the resistance of the neck, trunk and hips to small (±10°), slow (1°/s) torsional rotation during stance. Modulation of tone was determined by the torsional resistance to rotation (peak-to-peak, phase-advance, and variability of torque) and axial muscle activity (EMG). LBP subjects decreased trunk and hip stiffness following short-term AT training compared to a control intervention. While changes in static levels of postural tone may have contributed to the reduced stiffness observed with the AT, their results suggested that dynamic modulation of postural tone can be enhanced through long-term training in the AT, which may constitute an important direction for therapeutic intervention[11].

AT and chiropractic care, as part of a multidisciplinary approach study, were utilized for patients with chronic back pain. Sixty-seven patients with back pain of more than three months duration participated in a comprehensive four-week program which included back schooling, psychological intervention, and treatment by acupuncture, chiropractic, the Alexander technique and a pain specialist. At admission to the study, patients were asked to complete a questionnaire concerning their socio-demographic background and disease history. The study found that patients with chronic back pain seemed to benefit from this proposed multidisciplinary approach and the improvement was maintained for a period of six months[36].

Movement Enhancement

In another study on AT, postural and movement coordination as well as its effect on movement coordination was studied. Cacciatore et al examined "the sit-to-stand (STS) movement by comparing coordination (phasing, weight-shift and spinal movement) between AT teachers (n=15) and matched control subjects (n=14). We found AT teachers had a longer weight-shift ($p<0.001$) and shorter momentum transfer phase ($p=0.01$), than control subjects. AT teachers also increased vertical foot force monotonically, rather than unweighting the feet prior to seat-off, suggesting they generate less forward momentum with hip flexors. The prolonged weight-shift of AT teachers occurred over a greater range of trunk inclination, such that their weight shifted continuously onto the feet while bringing the body mass forward. Finally, AT teachers had greatly reduced spinal bending during STS (cervical, $p<0.001$; thoracic, $p<0.001$; lumbar, $p<0.05$)[9]."

Neck Pain

MacPherson et al (2013) are in the process of performing a study to evaluate the effect of Alexander Technique lessons and acupuncture in a rigorously conducted pragmatic trial with an embedded qualitative study. The trial will recruit 500 patients diagnosed with neck pain in primary care, who have continued to experience neck pain for at least three months with 28% minimum cut-off score on the Northwick Park Neck Pain Questionnaire (NPQ). The York Trials Unit will randomly allocate participants using a secure computer-based system. Twenty 30-minute Alexander Technique lessons will be provided by teachers registered with the Society of Teachers of the Alexander Technique and twelve 50-minute sessions of acupuncture will be provided by acupuncturists registered with the British Acupuncture Council. All participants will continue to receive usual GP care. The primary outcome will be the NPQ at 12 months, with the secondary time point at six months, and an area-under-curve analysis will include three, six, and 12 month time-points. Qualitative material will be used to address issues of safety, acceptability and factors that impact on longer term outcomes[3].

Quality of Life Improvement

A clinical trial carried out by McClean and Wye[7] in an experimental setting demonstrated the therapeutic value and effectiveness of AT lessons for chronic back pain, but little was known about the use of AT in national health service (NHS) outpatient pain clinics. An exploratory mixed methods service evaluation was performed to explore the role, acceptability and impact of an Alexander Technique teaching service at a hospital outpatient NHS Pain Clinic, including service users‟ (n=43) experiences of the service and the perceived benefits to the NHS. To capture changes in health, wellbeing, quality of life status and resource use amongst service users, we administered four validated, widely used questionnaires at three time points: baseline, 6 weeks and three months after baseline. We also carried out 27 semi-structured qualitative telephone interviews with service users, three months from baseline. The views and experiences of Pain Clinic staff and Alexander Teachers were explored in a series of face-to-face interviews[37].”

The findings of this study suggest that the AT teaching service is feasible, acceptable, and beneficial (in terms of improving service users ‟quality of life and improving patients” management of pain). Greatest changes were found in how service users managed their pain; for example, more than half stopped or reduced their medication, and the impact that the pain had on their daily life. This also led to some behaviour change and changes in awareness and self-knowledge from the service users. These attitudinal and behavioural changes may explain the finding that users of the AT teaching service appeared to reduce their pain-related NHS costs by half. They concluded that over time participants' relationship to their pain may change as a result of Alexander Technique lessons, which may lead to reductions in medication use and other NHS pain related costs. Therefore AT lessons can be seen as a useful adjunct to other pain management services provided in secondary Pain Clinics[37].

Conclusion:

While research is being gathered to support the use of AT for low back, neck, and craniomandibular disorders the benefit of AT is its low risk and active rehabilitative focus. Helping patients develop awareness through movement and developing a sense of postural balance both statically and functionally offer a significant biological plausibility to AT. AT

teachers call themselves “teachers” because they see the care rendered as being participatory and that the patient or student plays an important part of the therapeutic experience. AT therapeutic interventions may have a place as an important aspect of chiropractic care either by incorporating its principles into chiropractic or through interdisciplinary co-treatment.

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Chiropractic table sanitization and aqueous ozone as an effective green alternative: A proposed research study.

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Introduction

The chiropractic profession in recent years has been studying the need for hand[1,2] and chiropractic table sanitization[3-6]. Through a series of studies Evans et al, has made it clear that the chiropractic profession should no longer be using cloth tables since their studies found high level of pathogens and maintaining a cloth table sanitary was problematic[1,6]. Therefore the types of table covering suggested for the chiropractic profession relate to materials such as vinyl which will hold up to various types of cleaning agents.

In the Burnham et al 2009 study they assessed the microbes on chiropractic table headpieces from instructional adjustive technique laboratories, the student health center, the campus outpatient clinic, and an off-site clinic over a 12 month period. "Identification of microbes by differential staining and biochemical analysis yielded a variety of gram-positive bacteria in all 4 surveys." "Methicillin-resistant Staphylococcus aureus was found in the clinics in 3 of 4 surveys. Methicillin-resistant S aureus was not detected in the technique laboratories."[4]

Evans et al in a 2007 study evaluated 10 chiropractic treatment tables, selected for convenience in high use areas of a chiropractic outpatient teaching facility. They identified "gram positive (g+) and gram negative (g-) organisms and their differential analysis demonstrated several microbes after 24–48 hours incubation. Two treatment tables contained (g-) organisms and all tables contained at least some (g+) organisms including S. epidermidis, S. saprophyticus and S. aureus."[3]

Bifero et al, performed a 2006 study randomly analyzed 9 chiropractic adjusting tables for "microbial flora on the headrest, armrest, and thoracic portion of chiropractic adjusting tables to determine the presence of pathogenic microorganisms and identify the potential for nosocomial transmission." Their study yielded "a wide variety of gram-positive (G+) and gram-negative (G-) cocci and bacilli as well as standard fungi. Many were of the genus Staphylococcus. Methicillin-resistant S. aureus (MRSA) isolates were recovered from 2 separate tables."[5]

While all forms of pathogenic microbes residing on a chiropractic treatment table are a concern, the MRSA pathogen is particularly dangerous. This is because MRSA "is associated with difficult-to treat infections and high levels of morbidity."[7] MRSA is particularly of concern in the chiropractic profession since the majority of chiropractic care uses hands on methods that touch patients. The possible transmission from patient to table or doctor, or any number of permutations make both hand table sanitation and crucial for the chiropractic and other manual healthcare professions.

In all the studies assessing the microbial load on chiropractic tables it was consistently found that treating the table with a disinfectant helped to reduce the microorganisms to a safe level.[1-5]. Various types of surface disinfections have been used and most have some level of secondary risk. What is proposed in this comparative study it to investigate the role of a green alternative, aqueous ozone, as a surface disinfectant for chiropractic tables, since ozone

is an unstable molecule, safe in aqueous solution, a powerful anti-bacterial, fungal, viral agent, and its byproducts are water and oxygen.

The Center for Disease Control advocates the "5 Cs" (crowding, frequent skin-to-skin contact, compromised skin, contamination, lack of cleanliness) as important factors leading to the spread of community acquired (CA) MRSA transmission. Therefore hand and table sanitizing before and after patient interactions will help prevent the spread of this pathogen between patients and doctor. A heightened alert should be occur when the patient or doctor has compromised skin or open wound which may come in contact with the chiropractic table or the doctor's hands, body, or clothing.[7]

Objective

The objective of this investigation is to evaluate the currently used chiropractic table disinfectant spray (Lemon Fields) to the portable Aqueous Ozone (TSB 100) method of table disinfection in a busy technique lab setting for the removal of microbial pathogens.

Methodology

Synopsis: Chiropractic tables in a chiropractic teaching college's technique laboratory will be randomly selected and a pre assessment of the microbes on the table will be used as a baseline reading. One group of ten tables will use the sanitizing agent (Lemon Fields) that is currently being used on the tables. The other group of ten tables will use the Aqueous Ozone (TSB 100) sanitization method; both following the standardized protocol. All 20 tables will be swabbed weekly, on Wednesdays at noon for microbe growth. Following a period of 6 weeks the tables will then be checked again for microbes. The findings from both groups of table will be compared to each other and to the initial measurements.

Details: A total number of 20 standard sized chiropractic adjusting tables covered in of vinyl will be incorporated in the study. These tables will be divided into two equal groups with 10 tables on the east wing and 10 tables on the west wing, separated by a teaching stage in the middle. The trial will run for six weeks during the May through August term at Los Angeles College of Chiropractic located in Whittier, California.

Five tables in the middle of the east wing and five tables in the middle of the west wing will utilize Lemon Fields Disinfectant Cleaner (LFDC) in 1 liter spray bottles sprayed onto each table for 90 seconds and then wiped clean with paper towels, as per the manufacturer's SOP. The LFDC is used at a concentration/dilution of 2 ounces per gallon of water, in accordance

with regulation requirements and label instructions. The LFDC will be consistently prepared by an investigator directly involved in the experiment.

Five tables in the middle of the east wing and five tables in the middle of the west wing will utilize the portable aqueous ozone (TSB 100) dispenser and follow the manufacturer's instruction for use, which involves removal of all debris from the table surface, spray the table to wet down the surface until completely covered, wait 90 seconds, and wipe dry with a disposable towel (same as with LFDC), with strokes up and down and side to side. The TSB 100 dispenser will be consistently prepared by an investigator directly involved in the experiment.

Ambient room temperature will be digitally recorded in three locations, three times daily during the six weeks trial. Temperatures will be collected between 7:45 to 8AM, 12:45-1PM and 3:45-4PM. Temperature data will be collected one meter off the floor at the stage dividing the east and west wings, and from the center of both the east and west wing in-between the ten employed tables on that side. Since the environment in the technique laboratory varies significantly daily this will assist in documenting the potential for pathogen growth related to temperature fluctuation. The digital thermometer used will be calibrated prior to logging readings. An investigator will collect this data.

Swabs of the tables will be collected from three places on each table; the face cradle, the arm rests and the distal end of the table. The swabs will be cultured before the trial, and weekly during the trial on Wednesdays. At the conclusion of the trial data will also be collected. The tables will be swabbed by microbiology students not directly involved in the study. Each swab will be cultured in the microbiology class specifically evaluating for common microbial pathogens. Charts will be made of the student cultures collected to see if any, and what microbial pathogens have been detected. Using this data we will correlate, (if any correlation exists) time frame or temperature associations and compare the LFDS to the Aqueous Ozone disinfection method.

A survey will be conducted following the data collection with the people applying the LFDS and the Aqueous Ozone dispenser. The survey will compare ease of use, perceived usefulness, compliance issues, how often the containers needed filling, etc. for both devices.

A tangent cohort study is planned in cooperation with Orange Coast College where the O3 Dispenser will be compared to LFDC, high pH (pH 9) water, and herbal disinfectants. This separate comparison study will use actual control plating to measure the growth rates of staph and other common microbial pathogens.

Discussion

Ozone (O3), is a triatomic molecule, consisting of three oxygen atoms joined together. In its gaseous form O3 is a very unstable molecule and is very detrimental to all life forms that do not have a lipid cell membrane. While mammalian tissue does have lipid cell membranes, bacteria, viruses, fungi, mold, and yeast do not. For mammals O3 is detrimental to respiratory membranes such as when breathing, however when dissolved in water there is no known negative affect to human or animal tissue. When O3 is dissolved in water it is commonly termed aqueous ozone and can safely be applied to the skin, swallowed, open wounds, as well as other body orifices.

Since aqueous ozone appears to have no yet discernable risk and offers a significant benefit it offers a unique disinfection agent in healthcare. The safety of aqueous ozone as a sanitizing agent is characterized in its ability to be used on food products[8], water treatment[9], and function as an "environmentally friendly alternative."[10] A dental study attempted to "evaluate the antimicrobial effects of ozonated water on the sanitization of dental instruments that were contaminated by Escherichia coli, Staphylococcus aureus, Candida albicans and the spores of Bacillus atrophies." They concluded that "ozonated water was effective in reducing the CFU of E. coli, S. aureus, C. albicans and B. atrophaeus spores, suggesting that ozonated water can be used for the sanitization of dental instruments."[11]

Studies have found aqueous ozone successful in the elimination of bacteria, viral, and fungal pathogens[12,13]. Aqueous ozone can be an effective disinfectant for hand washing, cleaning of water bottles, as well as medical and dental devices. Since aqueous ozone can be used on the skin, in the mouth and other orifices, as well as swallowed with not only no adverse effect but more commonly can be used topically and internally for therapeutic applications.[11,14-16]

Aqueous Ozone Sanitizer Spray Bottle

The aqueous ozone used in this study utilized the TherOzone T-SB100 Sanitizing Spray Bottle which employs a proprietary electrolytic ozone cell made with boron-doped synthetic-diamond technology. The handheld battery-powered spray unit produces low concentration dissolved ozone (O_3) from water on demand from ordinary tap water.

The microbial efficacy of the T-SB100 has been confirmed by an accredited lab using the EPA OCSPP ii 810.2300 "Product Performance Test Guidelines." In this guideline EPA recommends the ASTMiii E1153-03 "Sanitizers for Use on Hard Surfaces, Efficacy Data Recommendations". This guideline describes test methods that the EPA believes will generally satisfy testing requirements of the FIFRA iv and the FFDCA v. The guideline addresses effectiveness testing of antimicrobial pesticides bearing claims for use as sanitizers.

The TherOzone product sample was tested per ASTM E1153-03 against each test bacterium on stainless steel carrier or glass slide, using 5 test carriers and 3 control carriers. The test microorganisms are: (S. aureus) (ATCC 6538) and (K. pneumoniae) (ATCC vi 4352). The sample should demonstrate a reduction of 99.9% (a 3-log10 reduction) in the number of each test microorganism over the parallel control count within a time period of 5 minutes. The test results indicate that the ozone-enriched water generated by the TherOzone spray bottle meets the requirements of the ASTM test method and can be used to sanitize hard surfaces.

Several tests have been conducted with a third party accredited laboratory that has demonstrated the efficacy of the spray bottle on a range of surfaces. The tests followed a modified AOACvii 961.02 "Germicidal Spray Products as Disinfectants". In the AOAC test, the bacteria are dried onto a surface and exposed to the sanitizer for the time period prescribed by the manufacturer (30 sec, 2 min, and 5 min). The remaining live bacteria are counted as colony forming units (CFU). The percentage 'kill' or 'log reduction' is calculated by comparing the results of the same test using tap water without ozone as the control.
The prior table lists the efficacy of the T-SB100 spray bottle on two common surfaces, against a representative sample of pathogens. Similar results were achieved with other surfaces such as, PVC vinyl, Formica®, Corian®, granite, silicone, chrome, and porcelain.

Bacteria	Time	% Reduction Glass	% Reduction Stainless Steel
E. coli	0.5 min	99.9	99.9
	2 min	99.99	99.99
	5 min	99.999	99.996
Salmonella	0.5 min	99.9	99.9
	2 min	99.99	99.99
	5 min	99.996	99.999
Staph. aureus	0.5 min	99.95	99.9
	2 min	99.99	99.98
	5 min	99.999	99.996
Listeria	0.5 min	99.9	99.9
	2 min	99.99	99.99
	5 min	99.993	99.993
E. faecium	0.5 min	99.9	99.96
	2 min	99.99	99.99
	5 min	99.996	99.996
Pseudomonas	0.5 min	99.9	99.9
	2 min	99.99	99.99
	5 min	99.990	99.993
Clostridium difficile	0.5 min	99.7	99.8
	2 min	99.93	99.92
	5 min	99.979	99.972

Comparative Sanitizing Agents

In this study the disinfectant utilized by the chiropractic college to sanitize its chiropractic tables is called "Lemon Fields." Lemon Fields notes its active ingredients are Alkyl Dimethyl Ethylbenzyl Ammonium Chloride and Benzalkonium Chloride.[17] Alkyl Dimethyl Ethylbenzyl Ammonium Chloride is used in pesticides and is described by the United States Environmental Protection Agency's as having an acute toxicity ranking.[18] Swiercz et al note that Benzalkonium Chloride's "toxic effect may cause a health problem of significant importance to humans."[19]

Other chiropractic college clinics have been noted to use other disinfectants such as:

PDI Super Sani Cloth's active ingredients as containing n-Alkyl dimethyl ethylbenzyl ammonium chloride and n-Alkyl dimethyl benzyl ammonium chloride. Its technical information notes that In accordance with the OPPTS/OECD Guidelines, Super Sani-Cloth would be classified as Toxicity Category 1.[20]

PSS Select Disinfecting/Deodorizing/Cleaning Wipes from Select Medical Products describes its active ingredients as dimethylethylbenzyl ammonium chloride and alkyl dimethylbenzyl ammonium chloride.[21] Hazards Identification HMIS/NFPA Rating: high flammability, moderate health hazard with contact to eye causing irritation, harmful if swallowed, repeated contact may cause skin irritation, and inhalation over exposure may lead to central nervous system depression.[22]

Clorox Disinfecting Bleach Wipes has sodium hypochlorite and sodium hydroxide as its active sanitizing agents. Sodium hypochlorite has been found to be of moderate concern due to secondary acute aquatic toxicity and respiratory effects. Some concern was found for general systemic/organ effects, developmental/endocrine/reproductive effects, cancer, nervous system effects, digestive system effects, kidney and urinary effects, skin irritation/allergies/damage, and damage to vision. While sodium hydroxide has been found to be relatively safe some studies have found evidence of skin irritation.[23]

Other common sanitizers used in chiropractic college clinics (see following table) primarily use some type of ammonium chloride derivative such as Cavicide Wipes and Spray[24], Virex II 256 One-Step Disinfectant[25], Zep Spirit II[26], Q128 Franklin[27], do-it ALL, Dymon[28], Citraguard Disinfectant[29], Basic G[30], and Discide[31]. All the various disinfectants or sanitizers offer some risk to the subject applying it (via skin contact or inhalation), the patient (direct prolonged skin contact), and environmentally (through patient clothing or when wiped with cloth or paper towel). Without any alternative the benefit of the various sanitizers outweigh the risk of pathogenic cross transmission.

Chiropractic College Clinic	Sanitizer	Active Ingredients
Cleveland Chiropractic College	Caviwipes	sodium hypochlorite didecyl dimethyl ammonium chloride
D'Yooville College	Cavicide	sodium hypochlorite didecyl dimethyl ammonium chloride
Life University	Virex II 256 One-Step Disinfectant	n-alkyl dimethyl benzyl ammonium chloride didecyl dimethyl ammonium chloride lauryl dimethyl amine oxide
Life Chiropractic College West	Zep Spirit II	n-alkyl dimethyl benzyl ammonium chlorides n-alkyl dimethyl ethylbenzyl ammonium chlorides
Logan College of Chiropractic	Q128 Franklin	didecyl dimethyl ammonium chloride n-alkyl dimethyl benzyl ammonium chloride
National University of Health Sciences	PDI Sani Cloth	n-alkyl dimethyl ethylbenzyl ammonium chloride n-alkyl dimethyl benzyl ammonium chloride
New York Chiropractic College	Cavicide Wipes and Spray	sodium hypochlorite didecyl dimethyl ammonium chloride
Palmer College of Chiropractic, Davenport	Clorox Wipes	sodium hypochlorite sodium hydroxide
Palmer College of Chiropractic, Florida	Clorox Wipes	sodium hypochlorite sodium hydroxide

Palmer College of Chiropractic, West	do-it ALL, Dymon	n-alkyl dimethyl benzyl ammonium chloride n-alkyl dimethyl ethylbenzyl ammonium chloride
Parker University	PSS Select Disinfecting/Deodorizing/Cleaning Wipes	dimethylethylbenzyl ammonium chloride alkyl dimethylbenzyl ammonium chloride
Sherman College of Chiropractic	Basic G - Shaklee	didecyl dimethyl ammonium chloride n-alkyl dimethyl benzyl ammonium chloride
Southern California University of Health Sciences	Lemon Fields	alkyl dimethyl ethylbenzyl ammonium chloride benzalkonium chloride
Texas Chiropractic College	PDI Sani Cloth AF3	n-alkyl dimethyl ethylbenzyl ammonium chloride n-alkyl dimethyl benzyl ammonium chloride
University of Bridgeport, College of Chiropractic	Discide Cloth Wipes	n-alkyl dimethyl ethylbenzyl ammonium chloride n-alkyl dimethyl benzyl ammonium chloride
Western States Chiropractic College	Citraguard Disinfectant by Citrus Resources	alkyl dimethyl benzyl ammonium chloride
** Information obtained through informal telephone survey (March 11-12, 2014) by calling the college's clinic and inquiring what table sanitizer they use in their clinic for between patient sanitizing.*		

Aqueous ozone offers a unique opportunity to control microbe levels without the subsequent adverse consequences to the applier, patient, and environment, representing a significant step forward in green technology for chiropractic table sanitizing. The TSB 100[32] creates aqueous ozone on demand at the push of a button and runs off of a battery that can be charged approximately 500 times without needing to be replaced. The reservoir holds 16 ounces of water and can be filled by using ordinary water. Conservative estimates by TherOzone USA, Inc have found that 5000 refills and applications can be used per battery life, and the battery can be replaced at a nominal charge. Therefore the safety for humans and environment along with it representing a trash saving technology may offer aqueous ozone a place within the chiropractic healthcare community for sanitizing chiropractic treatment tables.

Conclusion

Chiropractic table sanitization has become an important part of the chiropractic profession in order to protect patients and chiropractors from passing pathogens from doctor to patient, patient to doctor, and patient to patient. Healthcare encounters should at all times minimize risk as chiropractors attempt to offer examinations and treatment. It is possible that the use of aqueous ozone may offer the chiropractic profession the ability to utilize a green technology that prevents the spread of infection while at the same time reduces any toxic load on the patient, doctor, or environment. Further studies need to be performed to evaluate whether aqueous ozone is a viable sanitizing alternative for chiropractic treatment tables utilized in the clinical setting.

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Post concussion syndrome, temporomandibular joint disorders, and chiropractic dental co-treatment: A case report.

Thomas E. Bloink, DC, Charles L. Blum, DC

Introduction:

The awareness of sports-related concussions with post-concussion syndromes is gaining exposure in the chiropractic profession [1]. However, head trauma is common even when a subject is not participating in sports. For instance, in the United States, of 1.7 million people with traumatic brain injury (TBI), 52,000 die and 275,000 are hospitalized annually [2]. Still, sports-related concussion accounts for at least, and likely more than, 300,000 head injuries per year in the United States [3].

At the 4th International Conference on Concussion in Sport held in Zurich in November 2012, a consensus statement was developed helping to create a definition of concussion:

1. "Concussion is a brain injury and is defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilised in defining the nature of a concussive head injury include:

2. "Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an ''impulsive' force transmitted to the head.

3. "Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, symptoms and signs may evolve over a number of minutes to hours.

4. "Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.

5. "Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in some cases symptoms may be prolonged [4]."

The following case describes a patient who had a concussion with subsequent post-concussion syndrome symptoms that persisted for five months. Since treatment regimens for concussions and post-concussions are still being formulated [5,] low risk interventions such as chiropractic may offer a safe therapeutic approach to supplement care.

Case History:

On September 13, 2013 the patient, a 21-year-old caucasian female, stood up abruptly, felt lightheaded, and fell down forward into a desk hitting her head on the desk and then on the floor. She was momentarily unconscious and awoke on the floor with significant head pain.

Emergency services arrived, immobilized the patient, and transported her to the emergency room where she was examined and released. No CAT scan or MRI was performed.

Over the next few months she began to feel lightheaded and nauseous when exercising. These symptoms progressively worsened until she had to stop all exercise activities. Her symptoms progressed to include frontal and bilateral sphenoid headaches and were aggravated by all cognitive activities such as studying and using the phone, causing her to significantly reduce her physical and cognitive activities. After finishing school on December 12, 2013 she stayed in bed for much of the rest of the month. She noted some slight recovery following that time but had to significantly decrease all physical and mental activities now and felt profoundly constrained. For instance, driving caused her headaches, she routinely felt off balance when weight bearing, she was unable to attend school due to physical and cognitive limitations, and other related activities of daily living were also compromised.

Methods/Intervention:

Physical exam findings on February 12, 2014 noted the following: She had a close-locked TMJ, with no translation of right temporomandibular joint, along with decreased translation of left temporomandibular joint. Exquisite sensitivity was noted upon palpation at the right zygomatic maxillary joint, right zygomatic temporal joint, right upper medial orbit, right sphenoid wing, right temporomandibular joint, right squamosal and coronal sutures. There was evidence of clenching, significant maxillary buccal exostosis, which could have been secondary to clenching or dental parafunction and consistent with her malocclusion and bilateral working interference [6-8]. Evaluation noted photophobia and contrast sensitivity. She had convergence insufficiency with the left eye deviating laterally. Tuning fork bone conduction on right mastoid caused local irritation. She had a noted right occiput in a cranial extension position. The right occiput position led to compensatory hypertonicity and palpatory pain at the right gluteal muscles due to their attempt to maintain descending visual and vestibular postural righting [9]. Pelvic torsion with reduced sacral nutation (sacro occipital technique's category one) [10] was particularly noted at the upper left side of the joint while related sacroiliac joint right sided hypermobility (sacro occipital technique's category two) was stabilized .

Treatment consisted category one prone block placement with a physiological right short leg to reduce pelvic torsion and improve sacral nutation along with category two supine block placement to reduce sacroiliac joint right sided hypermobility [10]. Spheno-maxillary cranial adjusting [11] was performed based upon the patient's right inferior maxilla. Sacro occipital technique intraoral cranial adjusting treated her right occiput, which was in extension [12]. Due to her dental and TMJ-related presentations a referral was made to a dentist that specializes in temporomandibular joint disorders (TMD). The dentist performed an evaluation and delivered and equilibrated a mandibular occlusal splint on February 27, 2014, which was followed up on March 6, 2014 for one more equilibration. She was seen for a total of nine treatments at this clinic. Each dental equilibration at her dentist's office was preceded by sacro occipital technique category one and cranial treatments the same day.

Results:

As of March 18, 2014 the patient was completely pain free with no symptoms of lightheadedness, brain fog, or nausea. She has been able to exercise, and has been lifting light weights. She was also able to run five miles. This is a significant improvement given that her symptoms and lack of function were consistent since her accident of September 2013.

Discussion:

Physical exam revealed excessive clenching with malocclusion which was hypothesized to be triggering a head pain – TMJ parafunction – leading to increased head pain. Ultimately this cycle inhibited her ability to recover from her post concussion syndrome. Although not every post concussion syndrome may benefit from this therapy, it is possible that this particular subset with malocclusion and clenching secondary or related to head trauma or concussion may need to be evaluated in a new light.

Head trauma and TMD has some basis in the literature [13,14]. Yustin and Neff describe in a study of a "56-year-old female suffering from TMD caused by trauma to her temporal head area. The management consisted of occlusal devices until her condition stabilized followed by prosthodontic rehabilitation to obtain and maintain a physiologic maximum intercuspation [15]."

A relationship between dental occlusion and the use of TMJ splints, orthotics, or appliances to prevent secondary effects of head trauma or concussion has also been discussed in the literature. For instance Takeda et al reported that "Mouth guards can reduce distortion to the mandibular and the acceleration of the head from the same blow. So mouth guards might have the possibility to prevent mandibular bone fractures and concussions [16]." In a similar vein Singh et al studied concussion/head trauma prevention in high-school football athlete investigating the use of dental orthotics. They found that "preliminary results of this study suggest that a customized mandibular orthotic may decrease the incidence of concussion/mild traumatic brain injuries in high-school football athletes …[17]"

Conclusion:

With any case report the findings are limited due to the lack of control, possible regression to the mean, and any possible placebo/ideomotor effect. However, the temporal nature of the patient's response to care, the lack of response to prior therapies, and the length of her symptoms prior to care suggests that the care rendered played an important part of her recovery. Further research is needed to determine whether a subset of post-concussion or head trauma patients may have TMD which is limiting their ability to fully recover function and return to their activities of daily living. Collaborative efforts between emergency room doctors, chiropractors and dentists (with TMD care training) with post concussion patients may help ultimately lead to improved patient outcomes.

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Intervention in menorrahagia through chiropractic adjustment and spondylotherapy: A case report.

William J. Boro, DC

Introduction

Low back pain and female reproductive problems are the source of frequent consultations to a chiropractor. Low back pain, as one might expect, is the most common reason[1] and is generally found to have its etiology to be of biomechanical musculoskeletal origin. However other sources of referred back pain may be uterine conditions such as endometriosis and adenomyosis.[1,2] Although dysmenorrhea is a common female condition and Radler[3] states that 72% of patients with dysmenorrhea also have low back pain (twice as much as women without dysmenorrhea), there is little chiropractic literature relating to this condition.[1-14]

Menstrual disorder is the only female reproductive condition that chiropractors see more than rarely as reported in the National Board of Chiropractic Examiners' job analysis report.[2] Literature suggests that endometriosis may be present in up to 33% of menstruating females, adenomyosis may have an incidence of up to 20% of the same population.[1] A link is suggested between early menarche (ages 11 or 12) and increased incidence and severity of dysmenorrhea.[15] Primary dysmenorrhea is observed in women as young as 15 years old. [15] "Heavy bleeding (menorrhagia) is one of the most common problems women report to their doctors. It affects more than 10 million American women each year, approximately one out of every five women."[16]

A normal menstrual cycle is 21 – 35 days in duration with bleeding lasting on average five days with a total blood flow of 25-80 ml. A blood loss of more than 80 ml or lasting longer than seven days constitutes menorrhagia. Usually no causative abnormality can be identified, and treatment is directed at the symptom rather than at a mechanism. After a differential diagnosis is performed to rule out causes such as hypothyroidism, endometriosis, fibroids, endometrial polyps or cancer, ovarian or other endocrine disorder,[3] or coagulation defects, medical treatment may consist of prescriptive medications including hormone therapy, nonsteroidal anti-inflammatories,[3] or tranexamic acid.[16] Endometrial ablation or hysterectomy are surgical options.

Menorrhagia, described as excessive uterine bleeding, yearly affects up to 10 million American women in their forties and fifties. However, according to a survey performed by Shapley, Jordan and Croft in 2002, less than a third of women over 35 suffering from heavy bleeding actually discussed the problem with their doctor. Most of them (83%) expressed that the heavy periods were just something with which they would have to live .[2]

The purpose of this case report is to describe the clinical course, treatment, and immediate response of a female patient suffering from uncontrolled uterine bleeding of over two weeks duration to the application of chiropractic adjustments and the use of spondylotherapy.

Patient History

A 5'4", 164 lb., 37 year old, nulliparous female veterinary technician with a history of back and hip pain, headaches and asthma presented to this office on December 6, 2012 with

complaints of severe pain in her left hip. She stated the pain was similar to the pain she had had prior to her back "going out" in October 2011. She also complained of nonstop menstrual bleeding for the previous two weeks. The patient noted that she had an occurrence of prolonged menstrual bleeding the previous spring as well.

The patient indicated that her menstrual cycle has never been "normal", and since the age of 16 her cycles were of 36-45 days duration with bleeding lasting about seven days. On her heaviest days of bleeding, days 2 and 3, she had to use a super plus tampon every 1 – 1 ½ hours. A super plus tampon holds about 12 -15 ml of blood.[17] This calculates to more than 80 ml of blood on each of those two days. She stated that her periods were often accompanied with migraines and significant cramping.

Prior to her visit, she had been seen by her gynecologist who suspected fibroids, but none were observed on ultrasound. Hormone levels were tested and they were normal. The gynecologist recommended that the patient "deal with it" and it was felt that this amount of bleeding was "normal" as she had an IUD and the prolonged bleeding wasn't substantial enough to be a medical concern. It was suggested that she use a feminine product (tampon) daily.

The patient was concerned and stated that, "it is incredibly annoying to bleed for that long and I didn't think it was normal even though the gynecologist did. Also, you fixed my back and I thought I was willing to see if maybe you could help me, since I was having no cramps since I have been seeing you."

Other than a menstrually associated headache, reported on September 13, 2013, this was first the patient had reported of her menstrual issues.

The patient had been seen at this office for treatment intermittently since December 2011 when she first presented with severe low back pain which began in March 2011. An MRI had been performed on March 29, 2011 and demonstrated a "large broad-based central and left posterior paracentral disc herniation at L5-S1 with posterior displacement of the traversing left S1 nerve root and contact on the traversing right S1 nerve root. Moderate sized posterocentral disc protrusion eccentric to the left with annular tear at L4-5, with a mild impression on the traversing L5 nerve root bilaterally, left greater than right, and mild left lateral stenosis." She received an epidural injection in March 2011 which helped and a second epidural in October 2011 which did not help. Physical therapy had been prescribed which she continued until October 2011. Prescribed by her gynecologist were medications that included Percoset and Advil.

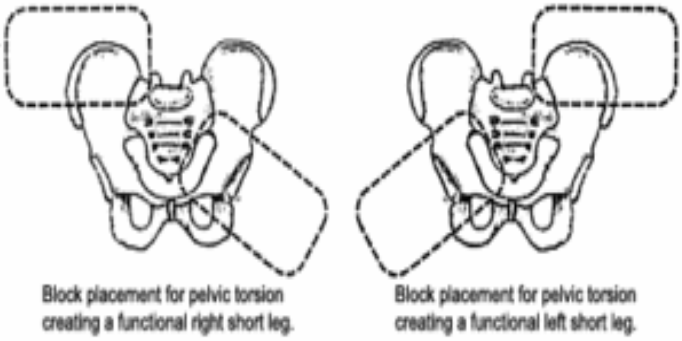
She presented to this office for the first time on December 21, 2011 when she reported severe low back pain, numbness in her left leg, pain on coughing or sneezing. She had difficulty in sitting, dressing herself, and having sexual relations with her husband. Examination revealed positive bilateral sitting straight leg raise, reduced and painful lumbar ROM, dermatomal loss of sensation, and indications of Sacro Occipital Technique's Category II (sacroiliac joint sprain or hypermobility syndrome) and Category III (lumbosacral sprain and discopathy syndromes). She received 18 treatments between December 21, 2011 and May 29, 2012 with her pain initially resolving by January 11, 2012, but returning briefly in February. She received treatment on two consecutive days in July 2012 after being hospitalized for an asthma attack the previous day. She returned again on September 13, 2012 hoping treatment would resolve a menstrual related headache as she was going on vacation in two days.

The patient was not seen again until November 6, 2012, at which time she shared information about her menorrhagia and other menstrual related complaints. After taking her history, a limited examination was performed. Positive findings on examination that day revealed: Trendelenberg (positive on the right), Sitting Straight Leg Raise (positive on the left), and Category II (positive on the left side) with inguinal ligament sensitivity on left side.

Methods/Intervention

Three treatments were performed to care for this patient's specific menorrahagic condition. On November 6, 2012: Sacro Occipital Technique Category II supine block placement to reduce pelvic torsion and improve sacroiliac joint juxtaposition; with patient in standing posture and assuming postures of flexion, extension, lateral flexion, and rotation adjustments were made to the lumbar spine (L1-5) with an activator instrument; and adjustments to femoral heads bilaterally.

Standing Adjustment in Lumbar



Sacro Occipital Technique Category Two Blocking

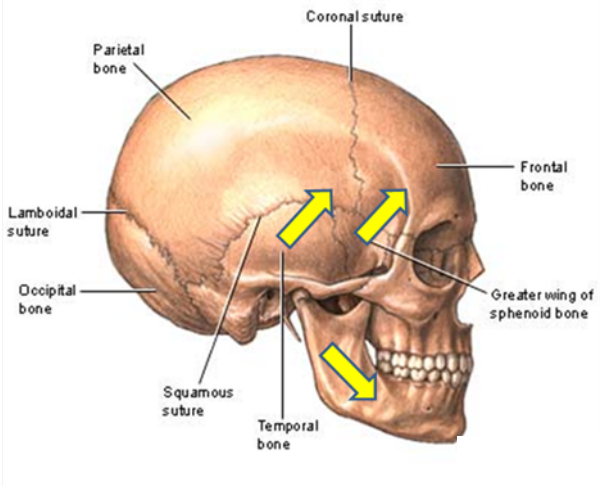
Spondylotherapy[19-21] was administered to C7 (4 minutes), L3 (2 minutes) and L5 (2 minutes) at a percussive rate of 200 beats per minute.[22]

Spondylotherapy to C7

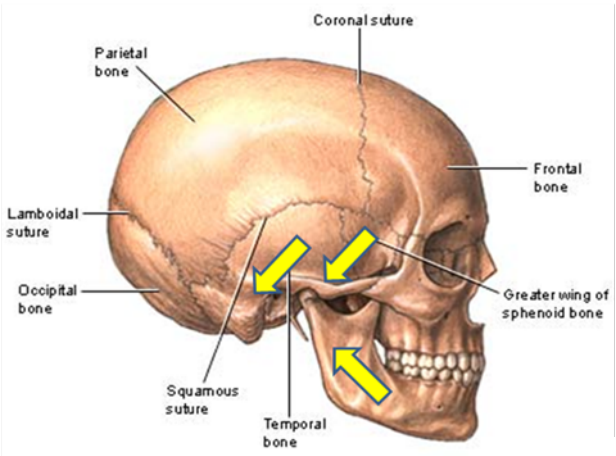
Pleximeter/Plexor

On November 13, 2012: Patient reported that the bleeding had stopped by 11/7/2012. Adjustments were made to T3, 5, 7, 9 vertebrae levels and their discs. Disc adjustments were performed utilizing a disc plexor according to Van Rumpt protocol. Spondylotherapy was administered to C7 (4 minutes), L3 (2 minutes) and L5 (2 minutes) at a percussive rate of 200 beats per minute.[22] On November 16, 2012: Adjustment to lumbar spine, discs and associated muscles and adjustment to the cranium utilizing anterior cranial pattern according to Van Rumpt protocol.[23]

Van Rumpt's cranial analysis involves subluxation listings on the temporal, sphenoid and mandibular bones. The anterior pattern consists of anterior/superior listings found of the sphenoid, temporal, and mastoid bones. The mandible is found to have an anterior/inferior subluxation listing. Corrective double thumb toggle adjustments are made to both sides of the skull.



Anterior Pattern



Correcting Anterior Pattern

The patient has returned to this office on 8 other occasions (last visit February 19, 2014) for various reasons (mostly for hip pain), but has had no menstrual or bleeding complaints throughout this time.

Discussion

Chiropractic care can offer conservative therapeutics with the goal of improving neurology and physiology to facilitate the maintenance of normal homeostasis of all systems. Several studies have been written describing the use of Sacro Occipital Technique in the management of female reproductive problems such as secondary amenorrhea,[24] uterine fibroids,[25] dysmenorrhea.[26] Through use of Chiropractic Manipulative Reflex Therapy, with or without combination of acupuncture methods, there was successful resolution of symptoms.

Both afferent and efferent nerve supply to female reproductive organs involve lower thoracic, upper lumbar, and mid-sacral segments. The efferent supply consists of sympathetic fibers originating mostly from the T12 - L2 levels, and parasympathetic fibers originating from sacral three, four and occasionally five. The sensory fibers enter the cord at vertebral segments T12-L2, and S2 - 4. "The close relationship between afferent and efferent cord

levels suggests the importance of viscero-visceral, viscero-somatic and somato-visceral reflexes… Thus … there is great potential for interference and modification of this (genital tract) activity by aberrant somato-visceral activity. For instance, vasomotor disturbance to the uterus can occur, and will differ depending on the physiologic state of the uterus."[14]

There is a concern regarding the differentiation of primary dysmenorrhea from secondary dysmenorrhea (includes factors such as endometriosis, infection, leiomyomas or adenomyosis). Assuming no obvious organic disease, conservative options can be considered. The mechanism of primary dysmenorrhea is unknown, but presumed to involve persistent, hyperactive sympathetic or parasympathetic stimulation. Chiropractic interventions might consider assessing whether either T11-L2 or the sacrum may be involved.[14]

Altered mobility or fixation of spinal segments has been hypothesized to cause abnormal somato-somato and somato-autonomic reflexes. Liebl et.al.[5] point out that areas of primary fixation were at L1, 2 and 5, sacrum and sacroiliac joints.

Various hypotheses are offered in the literature as to why non-medical approaches to dysmenorrhea help.[6,21,27] Various chiropractic hypotheses include "the removal of mechanical joint fixations correct aberrant motion and elicits a sympathetic response to inhibit uterine contraction"[12] or that the adjustment "interferes with pain reflexes that link the mental interpretation in the cerebral cortex to the physical manifestation of pain in the uterus,"[15] or how the psoas muscle may be involved in pain referral from the uterus.

Primary dysmenorrhea is associated with an increase in uterine vasculature throughout the menstrual cycle. "A dense vascular endometrium establishes the environment and opportunity for producing greater pain when sloughed from the uterine walls. The increased vasculature suggests a propensity for developing dysmenorrhea due to the inherent structural composition of the uterus."[15] I propose that one of the reasons for the successful treatment with spondylotherapy is its effect on returning tone to the uterine muscle and vasculature[19-21] and thereby reducing the amount of blood flow and loss from the uterine lining both during the cycle and at menstruation. If that tone is maintained in future cycles, then it may be considered that the lining maintains better tone throughout the cycle and therefore the patient experiences less discomfort and bleeding in future cycles.

Spondylotherapy was developed by Albert Abrams around 1903. His interest in spinal therapeutics developed deeply after investigating various visceral reflexes that he discovered bearing his name.[28-30] From simple yet astute observational beginnings, "he ascertained that a number of pathological conditions could be more easily and certainly controlled by spondylotherapeutic means, than by the conventional measures."[19]

> "Visceral reflexes may be evoked not only by cutaneous irritation but likewise by concussion and the application of sinusoidal current to the spinous processes of the vertebra. Reflexes elicited from the spinous process have been specified by the author as VERTEBRAL REFLEXES…..to excite the vertebral reflexes for therapeutic purposes, concussion by means of an apparatus is employed. For simple concussion the author employs a pleximeter and plexor…..In the therapeutic elicitation of the vertebral reflexes, the only kind of vibratory apparatus which is effective is one giving the PERCUSSION STROKE."[20]

Abrams described his early experiences with female reproductive problems:

> "Painful menstruation is subdued in conventional practice by treatment of the cause and the use of some analgesic during paroxysm of pain. The author has thus far examined about fifty patients who suffer from painful menstruation and has noted points of tenderness located either to the right or left side or both sides of one or more of the spines of the first four lumbar vertebrae. Firm pressure with the end of the thumb over one or more sensitive areas will abolish the pain for several hours or during the entire period of menstruation."[19]

Many contemporaries of Abrams studied and embraced his ideas. Alva Emory Gregory, M.D., D.C., in his text Spondylotherapy Simplified stated,

> "…spinal adjustment and spinal concussion, are excellent, but that a combination of the two methods is the most rational and efficient procedure, and experience has convinced us of this fact, since many cases recover from the use of both methods, which have failed to respond to either of these methods alone."[21]

Although there has been little current research[31] into the use or effectiveness of spondylotherapy, in the 1940s it was part of the curriculum at National College of Chiropractic including a chapter in one their required textbooks.[32]

Abrams explained its physiological application as follows:

> "The capacity of an organ to execute its functions is determined by the tone of its musculature…Unlike the skeletal, the visceral muscle receives its stimuli not directly but indirectly through the intermediation of ganglion cells. The visceral musculature shows elasticity, tonicity, irritability and conductivity. There is distinct periodicity in the movements of visceral muscle characterized by contraction and relaxation of the muscle fibers."[33]

The vertebra chosen for the application of spondylotherapy in the treatment of this patient were guided by recommendations from Alva Gregory and Richard Van Rumpt. Gregory states:

> "The seventh cervical segment contains a very important spinal center which…contains the cells of origin of the second pair of thoracic nerves, which have a very potent influence over the heart and vasomotor tone of the vessels for the general circulation…Stimulation of…the seventh cervical vertebra will induce…a very decided and general vaso-constriction.
>
> Concussion of the upper three lumbar segments will produce the results as follows:
>
> 1. Will excite uterine contraction
> 2. Will overcome atonic constipation
> 3. Will overcome uterine hemorrhage
> 4. Will excite contraction of the liver

5. Will excite contraction of the spleen
6. Will excite contraction of the stomach
7. Will excite contraction of the intestines
8. Will increase the tone of the colon and intestines."[21]

It is recommended that if, after a trial of conservative treatment, one finds the treatment outcome is less than expected or desired, that a referral be made to a medical specialist and further diagnostics be performed.

Inconsistent results as reported in chiropractic studies may be due to small sample sizes and the paucity of studies or the inherent problems of performing controlled randomized studies of interventions that make use of hands-on therapies. The positive changes may also be a result of the normal progression of the condition. Regardless, the lack of conclusive evidence does not mean these interventions do not work and are not worthy of consideration.[1]

Since many reports show hysterectomy to be the most 'cost effective' treatment (approximately $30,000 - $40,000)[34], a handful of chiropractic visits including spondylotherapy (significantly less for a series of treatments) makes this treatment approach worthy of investigation if only for the potential of reduced medical costs, not to mention the reduced human costs of pain and suffering.

Although studies have been performed showing that menstrual pain associated with primary dysmenorrhea may be alleviated by treating motion segment restrictions of the lumbosacral spine,[9,11] the strength of relationship between neuro-mechanical dysfunction of the lumbosacral spine and symptoms of primary dysmenorrhea need to be more conclusively established.
Since the patient has been treating at this office (December 2011), she states her periods have become more normal, are now mostly every 28 days without very heavy bleeding and minimal cramping.

While reviewing the literature it became apparent that the levels of spondylotherapy application might have been more appropriate at L1, 2, 3 instead of L5. However, since the somato-visceral and viscero-somatic reflexes are diffuse and not discrete, it is possible that the exact site of percussion may vary amongst individuals as it did with this patient.

Conclusion

Caution about generalizing these results to other patients is advised since without control groups or comparative sham interventions positive findings may relate to the placebo or ideomotor effect. Of interest is that the patient had the menstrual condition for years. Her response to care suggests a temporal relationship between the intervention and her positive response. That her condition has improved and has sustained itself is suggestive of this relationship, though it might also be considered to be coincidental or a regression to the mean. Further research is needed to determine if the care rendered in this case study might offer a low risk alternative for menorrhagia for a subset of patients that may be responsive to this novel chiropractic intervention.

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The correlation of the Arm-Fossa Test with other sacroiliac findings: A feasibility study.
Robert Cooperstein, MA, DC, Charles L. Blum, DC, Elaine Cooperstein, MS, DC

Introduction

The arm-fossa test (AFT) is a sacroiliac test used by practitioners of Sacro-Occipital Technique (SOT)[1], a proprietary style of chiropractic care originally developed by Major DeJarnette in the 1920s. It is part of a battery of SOT proprietary examination procedures that differentially diagnose Category 1 from Category II patients, who then enter into different care pathways. To perform the test, the examiner tests the responsiveness of the latissimus dorsi muscle with the patient supine, as the examiner successively makes light contact with the upper and lower portions of the left and right inguinal ligaments. The finding of a delayed latissimus dorsi muscle is thought to be consistent with Category II, which features sacroiliac hypermobility; whereas a strong muscle points toward Category I and sacroiliac hypomobility.

In several separate studies of various SOT examination procedures including the AFT test, LeBoeuff-Yde reported the following for the AFT:

- Intraexaminer reliability: high in one study[2] and low in another[3]
- Interexaminer reliability: low[3]
- Validity: some value in correctly distinguishing a correctly treated from an incorrectly treated group of participants[4]
- Validity: in relationship to lumbopelvic pain: sensitivity=54%, specificity=69%[5]
- Validity: no relation between side of involved fossa and side of sacroiliac fixation[4].

In a thesis written for a chiropractic college, Evans[6,7] included the AFT in a battery of tests for sacroiliac dysfunction. Among the many correlations analyzed, Evans found the kappa value for the AFT and the Gillet test = 0.20, with sensitivity and specificity = 42.1% and 78.7% respectively. Both Holliman[8] and Ganz[9] compared AFT and Gillet findings, but the findings were difficult to interpret beyond there being little agreement.

Two sacroiliac studies unrelated to SOT encouraged us to investigate the correlation of the AFT with the Gillet sacroiliac motion test. Although most of the Gillet test reliability studies reported low interexaminer agreement, Hungerford[10] reported good reliability for a version of the test. In addition, Cooperstein[11] described a refinement of the test that optimized its ability to detect sacroiliac motion, in which hip flexion is limited to approximately $30^{0.}$ Since a positive AFT is thought to correlate with sacroiliac hypermobility, and a negative AFT with hypomobility, we hypothesized that the finding of fixation using the Gillet test would predict a negative AFT, and no fixation a positive AFT.

Methods

We recruited a convenience sample of chiropractic college students who were enrolled in a weekend SOT seminar at a chiropractic college. Exclusion criteria included not being able to

lie prone, lie supine, or sit comfortably for up to 3 minutes; or declining to be touched by an examiner in the inguinal ligament area. We collected demographic data on age, sex, height, and weight of the participants, as well as history of past and current sacroiliac and low back pain. There were 3 examiners in the study. Examiner 1, the instructor for the seminar, has been teaching SOT for more than 32 years. Examiner 2 is an instructor at the college who is also proficient in and has taught SOT procedures. Examiner 3 instructs at the college in various sacroiliac orthopedic and pain provocative procedures. Two other individuals served as study coordinators.

Results

Of 15 participants screened, 14 met the inclusion criteria. The mean age was 27.9 years and 21.4% were female. Overall, we performed 7 tests on each participant: the AFT, unloaded and compressive leg checks, sitting PSIS palpation, a sit-stand test for anatomical leg length inequality, sulcus palpation, and sacroiliac motion palpation (Gillet test). The highest kappa value was for the AFT tests of examiner 1 in relation to the Gillet test results. The kappa value was 0.55, which corresponds to "moderate agreement" according to a standard classification scheme[12]. To calculate values from a 2-by-2 contingency table, we arbitrarily considered the AFT to be the index test whose results were being compared with the Gillet reference test. The sensitivity of the AFT for predicting fixation was 0.78 and its specificity was 0.80. The diagnostic accuracy was 0.79. Two other comparisons achieved at least a "fair" level of agreement: sulcus depth vs. the sit-stand test for anatomic LLI (kappa = 0.45), and sulcus depth vs. the compressive leg check for anatomical LLI: kappa=0.44. No other kappa values attained the level of "fair."

Discussion

In classic SOT, the AFT is part of a battery of about 6 proprietary examination procedures that distinguish so-called Category I from Category II patients[1]. A preponderance of clinical evidence leads to a patient being ascribed to one of these two categories, which lead to very different clinical care pathways. A positive AFT is thought to be consistent with (but does not taken by itself confirm) sacroiliac ligamentous laxity. Therefore, we sought to determine whether a positive AFT would predict a positive Gillet test. We hypothesized that a Gillet test with hip flexion limited to 30 degrees would serve as a more reliable reference standard for the AFT than would otherwise have been the case.

Since this was a feasibility study, a prelude to a future comprehensive study, we were not concerned that our small sample size would be underpowered to rule in or out statistically significant associations among test results. Although we did find a moderate degree of concordance in some of the tests, and relatively high sensitivity, specificity, and diagnostic accuracy; our results are somewhat brittle. Shifting a very few test results, given our n=14 sample size, would have markedly changed our outcomes. The three other studies we retrieved that explored the relation of the AFT to sacroiliac fixation calculated the correlation of the side of a positive AFT with the side of fixation. We did not think that a fertile direction to explore, since the finding of a positive AFT is thought to predict sacroiliac hypermobility on one or both sides, not fixation *per se*; and the finding of a negative AFT, sacroiliac hypomobility or even a normal functioning joint. Therefore, we defined agreement as a positive AFT and negative Gillet test, or a negative AFT and a positive Gillet test.

Conclusion

The study protocol we used provided a very useful dress rehearsal for a full study intended to determine whether the AFT may be worthy of inclusion in a battery of sacroiliac tests for sacroiliac joint dysfunction, or perhaps serve as a standalone test with diagnostic value. Its "good" correlation with the Gillet test in this feasibility must be interpreted very cautiously, and should not be presumed to evidence external validity. The results of this study suggest that the finding of a positive AFT may correlate with sacroiliac laxity, and a negative AFT with sacroiliac fixation. Future studies should also be designed to include more heterogeneous participants, a mix of symptomatic and asymptomatic participants.

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Sitting PSIS positions and prone blocking preferences: A preliminary report.

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Background

Blocking the pelvis with padded wedges, a technique procedure most closely identified with Sacro-Occipital Technique[1], is believed to correct torsional states of the pelvis, in which the innominate bones have rotated in opposed directions. Supine blocking is recommended for sacroiliac hypermobility, and prone blocking for sacroiliac rotation. In the prone position, one block is inserted under the ASIS of the anteriorly rotated innominate bone, or AS ilium; while the other block is inserted under the greater trochanteric area of the posteriorly rotated innominate bone, or PI ilium. In Sacro-Occipital Technique, the direction of pelvic torsion is identified by a prone leg check[1], in which a functional short leg is thought to be associated with a PI ilium, and a long leg with an AS ilium. Thus, leg checking is used to identify pelvic torsion, and padded wedges are inserted under the patient in a manner consistent with the leg checking results to correct that torsion.

Objectives

In the absence of any evidence suggesting that leg checking, a typically used indirect approach, can identify the existence and pattern of pelvic torsion, this study used a direct approach, PSIS palpation, to derive that diagnosis. Then, it tested the assumption that participant blocking preferences, as determined by provocative blocking[2], are related to inferred pelvic torsional patterns.

Methods

Having obtained Institutional Review Board approval for the study, we recruited 26 asymptomatic participants and obtained their informed consent. Each of them was examined in the seated position for evidence of PSIS positional asymmetry, by means of investigator 1 using his thumbs to determine their relative positions. The possible calls were low on the left (left PI), low on the right (right PI), or symmetric. Immediately following the palpatory procedure, the participant lay prone. Investigator 2 instructed each participant that a pair of blocks would be inserted under his or her pelvis, in two different positions, and that this would be followed by questioning as to whether position one was preferred, position two was preferred, or neither position was preferred. The participants were unaware of investigator 1's findings as to their PSIS positional asymmetries, to prevent their being biased in their blocking preferences. For each participant, the blocks were then inserted, one under the left ASIS and the other under the right greater trochanteric area, a pattern identified as “position I.” Immediately after, the blocks were removed and reinserted in the opposite pattern, identified as “position II.” Each of the investigators recorded the data on PSIS positions and blocking preferences on separate data sheets, to ensure independence of the observations.

Results

The results are presented in the table below. Two of the 26 participants were excluded from the study because the examiner could not confidently identify their PSIS locations. Of the remaining 24 participants, 21 exhibited preference for one of the blocking patterns, and 3 did not: 16 for pattern 1 (thought corrective of a right PI) and 5 for pattern II (thought corrective of left PI). The participants exhibited little difficulty in reporting a blocking pattern preference or lack thereof. Equivocation on their part was judged to reflect indifference between the patterns. Of the 24 participants, 12 were judged to have a lower PSIS on the right (thought to identify right PI), 4 to have a lower PSIS on the left (thought to identify left PI), and 8 were judged to have symmetric PSISs. A subset of 14 participants (bolded in the table) was judged to have both PSIS asymmetry and a clear blocking preference. Of these, 9 showed concordant right-sided PSIS calls and blocking preferences, 3 showed left-sided concordance, one was judged to have a left PI pattern but preferred right PI blocking, and one was judged to have a right PI pattern but preferred left PI blocking. Thus, 12 of the 14 study participants showed a concordant pattern of PSIS asymmetry and blocking preferences.

	Low PSIS Right (Right PI)	Symmetric PSISs (No Torsion)	Low PSIS Left (Left PI)
Pattern I blocking preference (Right PI)	9	6	1
No blocking preference (No Inferred Torsion)	2	1	0
Pattern II blocking preference (Left PI)	1	1	3

Discussion

Since about 1/2 of asymptomatic subjects and 3/4 of symptomatic subjects have been found to exhibit at least 1/4" of leg length inequality[3], it is implausible that a leg check can distinguish anatomic LLI from the functional LLI commonly thought to be associated with posterior innominate rotation. Moreover, as yet another confounding factor, several studies[4-7] have found an anatomic short leg to be associated with anterior innominate rotation and long leg with posterior innominate rotation. Given the lack of evidence that leg checking procedures accurately identify pelvic torsional states, and the abundant evidence that anatomic LLI predicts anterior innominate rotation, we decided against using leg checking to identify pelvic torsion. Instead, we chose a more direct examination procedure, static palpation of the pelvis in the seated position, as described by Levangie[8]. In a standing patient, PSIS asymmetry should not be inferred to identify pelvic torsion, because anatomic or functional leg length inequality (LLI) could also account for PSIS asymmetry, confounding the analysis. By comparison, examination in the seated position excludes LLI as a confounding variable, so that PSIS asymmetry is more likely to reflect, opposed innominate

rotations. Evidence is accumulating that congenital asymmetry of the innominate bones is minimal[9,10], it is likely that PSIS asymmetry reflects pelvic subluxation rather than innominate dysplasia.

The high degree of concordance that we found between the inferred pelvic torsional states and apparently corrective blocking preferences suggests that blocking subjects to reverse their torsional pattern would be a more viable clinical approach than blocking so as to increase the degree of pelvic torsion. Although no treatment was rendered in this study, it is plausible that the participants' immediate responses to provocative blocking[2], would predict positive clinical outcomes in a program of chiropractic care. We are aware of very few studies in chiropractic in which clinical outcomes have been shown to be enhanced when treatment is applied in accordance with the "listing" (in this case, the pelvic torsional state) as compared with some other manner.

The Kappa statistic was calculated to be .65 (excluding participants who were indifferent to either blocking position or did not have torsion), suggesting a very high concordance between results of PSIS palpation and provocative blocking. Including all participants, Kappa=0.43.

In this preliminary study, no attempt was made to determine the inter- or intraexaminer reliability of PSIS palpation, whether that palpation was accurate in relation to a gold standard, or whether there was test-retest reliability in participant blocking preferences. Each of these limitations poses problems that would be best addressed in future studies.

Conclusion

The results of provocative prone pelvic blocking and seated PSIS palpation were strongly concordant in this preliminary study. This suggests the feasibility of a larger study, using more subjects and addressing other limitations in this preliminary study. If the current findings are substantiated, it may cause Sacro-Occipital Technique practitioners and other chiropractors to re-evaluate the manner in which they obtain their indications for pelvic blocking.

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The short leg question in chiropractic: Qualitative clinical research on the significance of the type of "short leg"

Robert Cooperstein, MA, DC

Introduction`

Cooperstein published an article gathering the evidence that anatomic leg length inequality (aLLI) is a risk factor for pelvic torsion[1]. Specifically, the ilium tends to rotate posteriorly on the side of the anatomic long leg, and anteriorly on the side of the anatomic long leg. This effect is dose related, so that greater amounts of aLLI result in more pelvic torsion. This appears to be a postural strategy that attempts to level the pelvis despite the asymmetry in leg length. This response to aLLI is significant because manual therapists within and outside of chiropractic often associate pelvic torsion with LLI, but in the opposite direction. That is, a posteriorly rotated ilium supposedly occurs on the side of a short leg, and an anteriorly rotated ilium on the side of a long leg. The usual explanation of this is that posterior rotation of the ilium moves the acetabulum anteriorly and superiorly, thus creating a functional short leg. However, as can be seen in Figure 1,this mechanism would dislocate the symphysis pubis. Moreover, it was demonstrated in1936[2] and brought to bear on contemporary chiropractic technique by Hildebrandt[3] that torsion occurs around a horizontal axis through the symphysis, rather than through the sacroiliac or hip joints.

Figure 1. Posterior ilium rotation may swing the

Cooperstein[4] has drawn attention to the purely anatomic objections to this traditional model of the chiropractic short leg. As an alternative explanation, he suggests that righting reflexes on the side of a posterior inferior medial ilium (PI-medial ilium) would likely increase the tone of the ipsilateral suprapelvic muscles, notably quadratus lumborum and the erector spinae, thus drawing up the leg in the prone or supine position and creating a short leg. This muscular short leg model drew experimental support from research done using a novel table optimized for the detection and investigation of LLI[5], and is supported by writings of both Schneider[6] and Travel[7].

The short leg question

In his recent review article, Cooperstein concluded: "Given that many clinicians and technique systems believe that posterior innominate rotation occurs on the short leg side, the possibility exists that sacroiliac adjusting procedures may be using inappropriate vectors with a negative impact on patient outcomes" [1]. Since the appropriate clinical intervention apparently depends on whether the patient's short leg is anatomical or functional, it follows that it would be necessary to discriminate between the two[8-10]. Radiology, and more specifically scanogram x-ray, is generally regarded to be the gold standard for identifying aLLI. Although the accuracy of the scanogram has been put in question[11], and at least one author has opined he prefers the tape measure method (TMM) [12], radiology remains the reference standard against which other LLI detection methods are generally compared. According to some authorities plain radiology, which involves radiometric analysis of an upright pelvic x-ray, is a reasonable substitute for or even preferred to either plain or CT scanograms[11,13].

Radiological procedures for detecting LLI are costly, both in terms of economic costs and the potential hazards of exposing the patient to ionizing radiation. Thus, clinicians would generally prefer a lower cost, non-invasive method of detecting LLI. Visual method like supine and prone leg checks as generally performed by chiropractors do not convincingly distinguish aLLI from functional LLI (fLLI); quantifying the result by using tools like the Chiroslide[14,15] do not address that problem. Among the low tech methods that have been put forth, in our opinion four merit consideration.

Low tech methods to detect aLLI

Compressive leg check[16,17]

In this instrumented, prone leg checking procedure, moderate cephalad force is applied to the feet. This may overwhelm the effect differences in suprapelvic muscle tone have on the relative Y axis position of the lower extremities, thus revealing aLLI; or there may be some difference in the compressibility of the joint spaces of the lower extremities that becomes manifest with cephalad pressure.

Sitting/standing indirect leg check

Bourrdillon[18], as further clarified by Cooperstein[19], describes a method of detecting aLLI which depends on observing changes in the relative position of the posterior inferior iliac spines (PSISs) in going from the seated to the standing position. If the difference in seated PSIS positions changes going to standing (whether the difference increases or decreases in magnitude), than the most likely explanation is that there is aLLI.

Tape measure methods (TMMs) [12, 20-32]

Several TMMs (also called direct methods) have been described, with one end of the measure applied to either the anterior superior iliac spine (ASIS), umbilicus, or xiphoid process; and the other brought to either the medial or lateral malleolus. Woerman[32], in one of the oldest and more rigorous of studies that compared a variety of TMMs to a radiological reference standard, preferred measuring from ASIS to medial malleolus. Studies comparing the results of a TMM vs. a radiological gold standard tend to find it not more accurate than plus or minus 5 mm, and quite unreliable (i.e., imprecise).

Block indirect method [20, 25, 26, 32, 33]

The block (or indirect) method determines how many blocks of known magnitude are required to level the pelvis in a person with apparent pelvic obliquity. A pelvic inclinometer of some type may be used to assess pelvic obliquity and changes thereof, or iliac crest heights may be assessed purely visually.

Allis leg check[34]

In this visual test, the supine subject's knees are flexed to about 450 while the toes are closely approximated. The knees are sighted both from the foot of the table and the side of the table for asymmetry in either height or position along the y axis of the body. Cooperstein[34] concluded it lacked validity, primarily due to the difficulty of knowing the relative position of the hips.

Clinical importance of distinguishing aLLI from fLLI

The question of whether the posterior ilium is associated with an anatomical long leg or a functional short leg would hardly be a burning one if the incidence of aLLI were small. However, the preponderance of studies show that aLLI is common, and that its incidence increases in a symptomatic compared with an asymptomatic population[35]. The most oft-cited study is that of Friberg[35], who found that about 44% of asymptomatics receiving scanogram x-ray exhibited 5 mm or more aLLI, whereas the percentage increased to about 75% in a symptomatic population.

Therefore, simply assuming that observed LLI is functional rather than anatomical runs the risk of leading to possibly sub-optimal or even incorrect vectors in using manual therapy to address clinical conditions, signs or symptoms. Although it is not the purpose of the present article to review the evidence that the direction of a manipulative or mobilization procedure affects the clinical outcome, the author does believe this to be true; some data suggest particular lines of drive or correction do indeed make a difference; for example, in prescribing exercises[36] and in pelvic blocking procedures[37, 38].

Estimating how often mechanical vectors chosen by leg check results are appropriate
Table 1 identifies mainstream chiropractic techniques that associate functional short leg with PI ilium: Thompson, PST, SOT, Activator, AK, and Diversified. Doctors of chiropractic practicing any of the techniques above, and osteopaths and physical therapists who share their understanding that a short leg predicts a posteriorly rotated ilium (and a long leg an anteriorly rotated ilium) might be using the wrong vector when the patient actually has aLLI. In an asymptomatic population, we would expect almost 50% of patients to exhibit at least 5 mm of aLLI[35], and we may assume most of these would receive the wrong mechanical vector. In a symptomatic population, with 75% having aLLI of at least 5 mm[35], and assuming a perfectly accurate leg check, we would expect most patients to receive the wrong mechanical vector, although some will not. Although we do not know what proportion of low back patients are likely to be symptomatic in a typical practice setting, let us perform the calculation when half the low back patients are symptomatics. Then, 50% of the asymptomatic half of the total patient population, or 25% of all patients, might get the wrong adjustment; and 75% of the symptomatic half, or 37.5% of all patients, might get the wrong adjustment. Thus, a total of 62.5% patients would get the wrong adjustment. Looking at the chiropractic profession alone, most of the techniques on the list of the ten most practiced according to a NBCE survey[39], use traditional leg checking and probably collectively account for the majority of office visits.

Although we have so far presumed a perfectly accurate leg check, we must consider the possibility that the low tech procedures used for detecting LLI may be inaccurate, especially for LLI below 5-6 mm. There are very few studies assessing the validity (i.e., accuracy) of visual methods of leg checking. Rhodes found poor agreement with a radiological gold standard[49], and the high validity found by Cooperstein et al for compressive leg checking used a novel, atypical method that is not generally practiced[16,17]. So, although we do not really know how accurate traditional leg checking might be, let us assume a 75% accuracy rate. Then, using that same number 62.5 % calculated above for the proportion of patients getting the wrong adjustment (using the short leg = PI rule), then 62.5% of 75%, or 46.9% of all patients would receive the wrong adjustment. Among the other 25% of the patients, where the leg checking results are inaccurate, 37.5% of 25%, or 9.4% of all patients would get the

wrong adjustment. Thus, a total of 56.3% of patients would get the wrong adjustment, which is better than would have been the case assuming perfect accuracy in leg checking.

Table 1. Mainstream chiropractic techniques that associate functional short leg with PI ilium	
Technique System	**Comments**
Drop table: Thompson[40,41] and Pierce-Stillwagon Techniques[42]	Drop table practitioners use the so-called Derifield leg check to obtain both cervical and sacroiliac listings. Although a distinction is made between Derifield positive and negative findings, having to do with what happens to the LLI seen prone when the patient's knees are flexed to about 900, in both cases the ilium is said to have gone posteriorly on the side of the prone short leg.
-Sacro-Occipital Technique (SOT)[43,44]	SOT practitioners often treat patients by inserting padded wedges under the prone or supine patient. As a general rule, one block is inserted near the iliac crest, and other at about the level of the greater trochanter. The wedges are inserted to a large extent according to the side of the short leg, which is presumed to identify a PI ilium.
Activator Methods Chiropractic Technique (AMCT) [45-47]	AMCT, like the drop table techniques, uses the Derifield leg check variation to determine the side of so-called pelvic deficiency. Thus, the side of a short leg, as detected using during a prone leg check, is presumed to identify the side of a PI ilium.
Applied Kinesiology and spin-off Kinesiology techniques[48]	The Kinesiologies agree that a short leg is associated with a PI ilium. They would add that there is an underlying pattern of either weak muscles that allow pelvic torsion, or strong muscles that effect pelvic torsion. For example, weak thigh flexors would allow posterior pelvic rotation, whereas hypertonic thigh flexors would effect anterior pelvic rotation.
Diversified Technique (DT)	Although DT is not as clearly defined as the other listed techniques, being less associated with a specific technique developer or constituted body of writings, most of its practitioners would generally agree that a short leg predicts a PI ilium.

Paradoxically, since using the PI=short leg rule generates the wrong vector of correction most of the time, the clinical situation actually improves taking into account that some leg check determinations will be wrong. In fact, if leg checking were 100% accurate, the doctor would be using the wrong vector only 38.5% of the time, as good as it gets.

Conclusions

At best, doctors and other health care practitioners deriving mechanical vectors of correction from visual leg checking procedures, who associate a short leg with a posteriorly rotated ilium, are manipulating or mobilizing the low back using essentially random lines of drive. What little evidence we have on the importance of the mechanical vector suggests these random clinical interventions are likely to produce sub-optimal clinical outcomes. To improve clinical outcomes based in part on the information provided by leg checking, it will be necessary to take into account whether the patient exhibits aLLI or fLLI. If a pelvic x-ray

is available, that will help in the discrimination. Short of that, using one or better yet an amalgam of the low tech methods described above is the best one can do.

Of course, one could always find some other way altogether for deriving lines of drive for sacroiliac and other interventions. Cooperstein has described a seated test for pelvic torsion[50], modeled after the work of Levangie[51], as well as a prone palpatory test for sacral rotation based upon the work of Kuchera[52]. He has also described how padded wedges can be used to derive an appropriate mechanic vector for sacroiliac intervention[38,53]. It may be that the primary importance of leg checking is to identify aLLI, as a risk factor for a variety of lower extremity and spino-pelvic conditions; and that the benefit of trying to infer appropriate lines of drive for sacroiliac interventions from a putative functional short leg is outweighed by the possibility of misinterpretation.

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The influence of the chiropractic treatment in patients with insulin resistance associated with diabetes type 2: A case series.

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Introduction:

Diabetes Mellitus (DM) is characterized by increased blood sugar levels that result in absolute and/or relative damage to the secretion of insulin and/or in the action of the insulin[1] due to a combination of insulin resistance and dysfunction of the pancreas beta cells. Generally an increase in sugar in the bloodstream signals the to increase the secretion of insulin, which by attaches to the body's cells, removing sugar from the bloodstream so that it can be used for energy. In insulin resistance, the body's cells have a diminished ability to respond to the action of the insulin hormone. To compensate for the insulin resistance, the pancreas secretes more insulin. The production of the insulin occurs in the endocrine portion of the pancreas and is regulated by metabolic, hormonal and neural factors, all of which are affected by the autonomic nervous system[2].

Historically insulin resistance was considered to be a causative factor underlying the etiology of DM type 2[3,4]. Insulin resistance in muscle and fat cells reduces glucose in the cell causing increased insulin to be released into the blood, raising blood glucose levels., In essence insulin resistance in liver cells results in reduced glycogen synthesis and storage and a failure to suppress glucose production and release into the blood. Insulin resistance normally refers to reduced glucose-lowering effects of insulin. Elevated blood fatty-acid concentrations (associated with insulin resistance and DM type 2), reduced muscle glucose uptake, and increased liver glucose production all contribute to elevated blood glucose levels[5].

High plasma levels of insulin and glucose due to insulin resistance are a major component of the metabolic syndrome, a syndrome with a group of risk factors that raises a patient's risk for heart disease and other health problems, such as DM type 2 and stroke[6]. If insulin resistance exists, ultimately more insulin will need to be secreted by the pancreas. If this compensatory increase does not occur, then blood glucose concentrations increase and lead to DM type 2[5].

A substantial body of epidemiological evidence has found that insulin resistance is an important factor in the development of cancer at various sites, including the colon, liver, pancreas, and endometrium[7]. Interestingly, an inverse relationship appears to exist between these cancers and physical activity and coffee consumption, both of which are known to reduce the risk of DM. "Interventions directed at or involving these variables should contribute to decreasing the risk of insulin resistance-associated cancer[7]."

Since insulin resistance has far reaching healthcare consequences, interventions that could help limit its secondary morbidities would be of significant value. For that reason this study was performed to help evaluate whether chiropractic care might be a conservative, low-risk intervention to reduce insulin resistance and facilitate the reduction of its secondary adverse effects. Since some low-level evidence has found that chiropractic care may demonstrate some influence in non-musculoskeletal interactions, such as in the blood sugar levels in DM individuals type[8-13], this study was performed to analyze any possible influence of chiropractic treatment on patients with DM type 2 and insulin resistance.

Methods:

Four patients with DM type 2 with insulin resistance were selected by an allopathic diabetes specialist to participate in this study following their initial clinical and laboratory examination. Institutional review board approval was applied for and received in order to properly perform this study. The patients' age ranged from 47 to 82 years old and included three females and one male. Selection criteria for this study was not based upon symptoms, but rather if the subject presented with DM type 2 or glucose intolerance.

The treatment consisted of eight chiropractic office visits that incorporated chiropractic adjustments to the spine and chiropractic manipulative reflex technique (CMRT)[14] to balance viscerosomatic/somatovisceral reflexes to the pancreas. Laboratory blood tests were taken on the second and eighth office visits, before and after the chiropractic adjustment. The laboratory analysis sought to determine fasting insulin and blood sugar levels with insulin resistance calculated using the homeostatic model assessment – insulin resistance (HOMA-IR) index[15]. HOMA-IR is an equation that helps estimate insulin resistance and β-cell function from fasting glucose and insulin levels.

$\text{HOMA-IR} = \frac{\text{Glucose x Insulin}}{22.5}$	$\text{HOMA-IR} = \frac{\text{Glucose x Insulin}}{405}$
$\text{HOMA-}\beta = \frac{20 \text{ x Insulin}}{\text{Glucose - 3.5}}$ %	$\text{HOMA-}\beta = \frac{20 \text{ x Insulin}}{\text{Glucose - 63}}$ %
Glucose in molar units mmol/L	**Glucose in mass units mg/dL**

Results:

In the laboratory blood analysis prior to the chiropractic treatment on the subjects' second visit, the average of the insulin resistance values was HOMA-IR=5.63 and then taken again following the chiropractic treatment was HOMA-IR=5.61, suggesting that the chiropractic intervention by this second office visit was not sufficient to modify their insulin resistance. By the eighth visit, prior to the subjects' chiropractic treatment, the average HOMA-IR equaled 3.79 and after the chiropractic intervention the average HOMA-IR equaled 4.08. Therefore it was observed that, after the eight visits, the levels of insulin resistance, following chiropractic care, had decreased significantly when compared to prior to the chiropractic intervention.

Discussion:

As chiropractic care moves into the 21st century, the care of patients could expand into the wellness care arena[16-19] including whole body kinematic chain evaluation and treatment, and assessing patients for viscerosomatic/somatovisceral, autonomic nervous system, and other non-musculoskeletal imbalances[20].

As wellness care continues to grow within the chiropractic profession, the care of patients with non-musculoskeletal conditions will need to be further studied. Since there is a minority of patients as well as chiropractors noting unexpected non-musculoskeletal symptom improvement following care[21-24], greater study is indicated to determine what subset of

patients with non-musculoskeletal conditions might best be served by chiropractic interventions.

The complexity of treating non-musculoskeletal conditions by chiropractic care occurs since the care rendered for this subset of patient often has a non-specific effect. While this care might have a placebo relationship, it may be possible that as long as a patient is properly assessed and treated utilizing an interdisciplinary approach that includes chiropractic care, that any stimulation of a placebo effect could be seen as therapeutic. For instance a study by Jameson suggested that "the placebo response to chiropractic care should ideally be maximized in every clinical encounter and acknowledged in chiropractic education[25]."

Nansen and Szlazak reviewed over 350 articles within the scientific literature over a 75 year period of time which led them to determine it is "firmly established that somatic dysfunction is notorious in its ability to create overt signs and symptoms that can mimic, or simulate (rather than cause), internal organ disease[26]." They reported that the purported "cures" of presumed organ disease observed over the years in response to spinal manipulation could be attributed to an entity termed "somatic visceral-disease mimicry[26]."

While the placebo effect and visceral mimicry syndromes are something that may well be a part of non-musculoskeletal chiropractic interventions, research seems to be presenting other possible neurological mechanisms are taking place. Budgell found that there was neuroscientific research supporting "a neurophysiologic rationale for the concept that aberrant stimulation of spinal or paraspinal structures may lead to segmentally organized reflex responses of the autonomic nervous system, which in turn may alter visceral function[27]." Sato appeared to confirm this by noting that "various somatic sensory stimulations, including cutaneous, muscle and articular sensory stimulations, can produce differing autonomic reflex responses, depending on which visceral organs and somatic afferents are stimulated[28]." Sato extrapolated this relationship to the chiropractic field by suggesting that "somatovisceral reflex responses may be functioning during spinal manipulative therapy in conscious humans[29]."

Studying non-specific non-musculoskeletal effects of chiropractic care in order to isolate specific discrete neurological relationships is a difficult task because some possible autonomic nervous system "responses have propriospinal and segmental characteristics, while others have supraspinal and generalized characteristics in their reflex nature[28]."

Pickar noted a relationship between spinal manipulation and its effect on reflex neural outputs to both muscle and visceral organs. He found substantial information "shows that sensory input, especially noxious input, from paraspinal tissues can reflexively elicit sympathetic nerve activity[30]," though "knowledge about spinal manipulation's effects on these reflexes and on end-organ function is more limited[30]." A study on anesthetized animals by Kimura and Sato corroborated a prior study by Sato[28] and suggested that "various forms of somatic sensory stimulation can produce different autonomic reflex responses, depending on the visceral organs and which somatic afferents are stimulated. Some responses have propriospinal and segmental characteristics, while others have supraspinal and systemic characteristics in their reflex nature[31]."

Bolton and Budgell suggested that it may be reasonable to attribute visceral effects of spinal manipulation to somato-autonomic reflexes, but suggested also an alternative mechanism such as somato-humoural pathways may exist. They concluded that "while the literature

confirms that mechanical stimulation of the spine modulates some organ functions in some cohorts, a comprehensive neurobiological rationale for this general phenomenon has yet to appear[32]."

The research on chiropractic care of DM and insulin resistance syndrome is sparse. Some of this is due to the difficulty of determining discrete relationships to non-specific diffuse neurological phenomena. One case study of a patient with DM and elevated glucose levels found that chiropractic care helped to normalize glucose levels[9]. The treatment consisted of sacro occipital technique, occipital fiber diagnosis and treatment, and chiropractic manipulative reflex technique (CMRT) for the pancreas and adrenal glands. The patient would seek care because he found his glucose levels would normalize for 3-4 weeks following chiropractic care. While this care did appear to have a direct cause and effect relationship over the five during which years the patient received treatment, ultimately in the fifth year chiropractic care had a reduced effect over time and he needed medication and later insulin supplementation[9].

Ferrance and Wyatt cautioned that "neuromusculoskeletal sequelae of DM are common and the practicing chiropractor should be alert to these conditions…[33]" Although some of these DM neuromuscular related conditions can be treated with conservative chiropractic care (e.g., hydroxyapatite deposition disease, diabetic cheiroarthropathy or limited joint mobility, carpal tunnel syndrome, adhesive shoulder capsulitis, diffuse idiopathic skeletal hyperostosis, and ossification of the posterior longitudinal ligament), some may be best treated within an interdisciplinary relationship (e.g., neuropathic ankle and/or foot joints), and others may require immediate medical management (e.g., muscle infarction or osteomyelitis/septic arthritis secondary to joint and/or bone pain with a fever) [33].

The inflammation that affects various joints in DM patients may also have a relationship to insulin resistance syndrome. Recent DM studies which involve insulin insensitivity seem to show increased cytokine production and markers of inflammation. Grimble concluded that evidence at present favors "chronic inflammation as a trigger for chronic insulin insensitivity, rather than the reverse situation[34]." It is therefore possible that chiropractic care could include recommendations concerning nutritional or dietary modifications to help reduce chronic inflammation[35].

Some emerging research is also suggesting a relationship between DM type 2 patients and intervertebral disc herniations[36]. Robinson et al determined that intervertebral discs in DM patients "have proteoglycans with lower buoyant density and substantially undersulfated glycosaminoglycan, which with the specific neurologic damage in these patients, might lead to increased susceptibility to disc prolapse[37]."

Ultimately treatment of DM and/or insulin resistance syndrome within the chiropractic profession is multifaceted. One aspect may be dealing with secondary neuromusculoskeletal complications, nutritional related inflammatory processes, and general wellness care to optimize a patient's outcome. Another aspect may be evaluating and treating neurological reflex dysfunction affecting autonomic, viscerosomatic/somatovisceral, somato-humoural, and other neural relationships.

With any non-randomized controlled study, it is difficult to generalize these findings to the population at large. This is due to possible placebo or ideomotor effects, regression to the mean, or possible unrelated coincidental findings. Limitations to this study include the small

sample size, the lack of a control group, the lack of blinding of both the doctor and patient, and there was no comparative sham intervention. Future research should address these limitations so there can be greater applicability of that study's findings.

Conclusion:

It is interesting to note that the findings of the HOMA-IR in the four patients following eight chiropractic treatments noted that the levels of insulin resistance had decreased significantly when compared to the beginning of the treatment. Considering the results presented in this study, it was concluded that the chiropractic treatment appeared to have an influence on the blood sugar and quantity insulin levels. Basal levels of blood sugar and insulin were reduced, which resulted in the reduction of the insulin resistance in the patients studied. Conservative low risk procedures including chiropractic to help patients with DM and insulin resistance may be an important consideration in future interdisciplinary wellness and preventative care management. Further research is needed in this arena to determine which subset of patients and type of chiropractic care would achieve the optimal results.

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The history of temporal sphenoidal (TS) diagnosis and its clinical applications.
Kenneth Y. Davis, DC, Charles L. Blum, DC

Introduction:

When treating patients it is often essential to find some way of generalizing their presentation so we can assess how to treat a patient and follow their progress. Commonly in chiropractic, orthopedic and neurological tests are used to gain a generalization into the patient's presentation, determine what care might best be rendered and whether the patient has a positive response to this care.

Temporal sphenoidal (TS) diagnosis is an assessment tool discovered by Major Bertrand DeJarnette[1] and developed by M. L. Rees[2-4] in the 1960s. TS diagnosis is based upon palpatory exploration of the circumference of the greater wing of the sphenoid and temporal bones assessing regions of swelling and/or sensitivity to the patient. Rees considered this TS ring to be a kind of master control panel "circuit breaker box" for all vital functions in the human body. He believed that a stressed viscus anywhere in the body flashes its distress (viscerosomatic reflex) signal to the brain through this control panel. He purported that when these reflexes are received at the TS region, the brain interpreted this signal, and sought to regulate or improve the function of the distressed viscus.

In the early 1960's, DeJarnette handed the TS research project to Rees. In 1963, Rees reported he had observed an interesting change that occurred before and after a chiropractic adjustment in the area of the patient's external auditory meatus. This occurred at the Aladdin Hotel in Kansas City, Missouri, at the annual Sacro Occipital Technique Clinic. Preliminary physical examination purportedly determined that a tortuous external auditory canal was found. After a sacro occipital adjustment, it appeared that the ear canal had normalized, even though direct treatment was not rendered to the ear canal. This clinical response confirmed to Rees the need to follow up on the work of DeJarnette since he believed the patient's response suggested that the temporal bone was connected in some way to body function.

The TS Points and EEG

Subsequently Rees studied the TS points extensively and attempted to determine how these reflex points might relate to the body and be used for diagnosis and guiding treatment. His initial theory suggested that the TS points on the skull helped to monitor messages sent from a vital organ as sensory feedback to the brain. He believed that these messages could be measured by an EEG (Rees used an oscilloscope) as micro-voltages of an alpha wavelength. Therefore when an organ was stressed, the matching TS point had an imbalance of alpha wave production compared to the other points, thus setting up a local hyperexcitability or reduced inhibition effect on the active TS point.

To deal with this effect and attempt to balance this reflex activity Rees developed a method he termed the "Alpha Wave Enhancement" technique to address this imbalance and facilitate both afferent and efferent supraspinal visceral communication. Just as direct visceral manipulation procedures are to restore motion, flow, or reflex activity of the central nervous system (CNS), autonomic nervous system (ANS), lymphatics, and viscera, the Alpha Wave Enhancement technique was believed to support the visceral manipulations by restoring or balancing the bioelectric or electro-magnetic fields of the body. Ultimately the goal of the Alpha Wave Enhancement technique is to restore the communication pathways between the CNS/ANS and by locally enhancing alpha wave production in the region of the TS point.

TS Points and Alpha Wave Enhancement Technique:

The purpose of this article is to give the reader a window into how Dr. Rees utilized these reflex diagnostic points and Alpha Wave Enhancement as a means to improve clinical outcomes. TS diagnosis is based upon what Rees called the sixteen vital functions of the human body, which will be discussed.

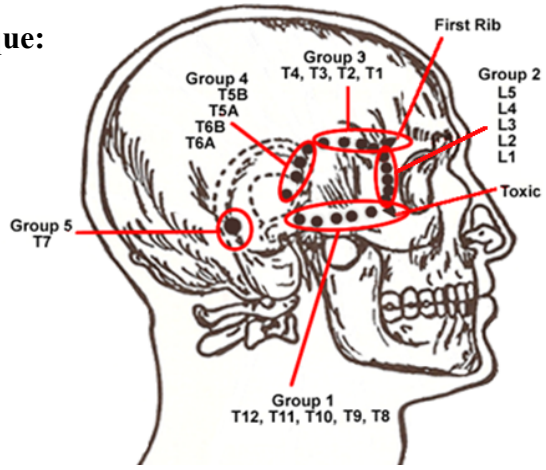


Figure 1: The 5 general screening

Methodology:

The General Screening:

General screening is a technique for testing multiple TS points as a group in search of "active" or sensitive points indicating an active reflex. This screening technique allows the doctor to isolate the most sensitive TS point by palpating the reflex points utilizing five pounds of finger pressure. While palpation for pain is the most reliable method of assessment, Rees also incorporated what DeJarnette called "Mind Language Testing[5]" or Goodheart called "Therapy Localization[6]." DeJarnette and Goodheart's assessment methods utilize pre and post testing; most commonly evaluating patient's straight right arm strength when contacting the various TS points.

Goodheart hypothesized that the activity of TL correlates with a spinal gating mechanism reminiscent of the gate control theory of pain perception[7]. Specifically, therapy localization stimulates mechanoreceptors, thereby influencing pain perception and muscle function. The essence of therapy localization or mind language is that input from low-threshold mechanoreceptors in the skin can modulate ongoing activity in muscles. This is consistent with Hilton's Law which states: "a nerve trunk which supplies the muscles of any given joint also supplies the muscles which move the joint and the skin over the insertions of such muscles." [9-10] Based upon this law and supporting EMG studies, we can assume that dermatomes are neurologically integrated with myotomes and sclerotomes producing associated sensory and motor dysfunction. Should there be an organic or biomechanical encroachment or compression affecting the ventral nerve root, for instance, we can anticipate autonomic impairment in the associated viscerotomes and dermatomes[11].

As a means of isolating the most active TS point(s) Rees developed five screening groups as depicted in Figure 1 and outlined below.

TS Group 1: consists of six TS points: T12, T11, T10, T9, T8 plus the "toxic" point.

TS Group 2: consists of five TS points: L1, L2, L3, L4, and L5.

TS Group 3: consists of five TS points: First Rib, T1, T2, T3, and T4.

TS Group 4: consists of four TS points: T5B, T5A, T6B, and T6A.

TS Group 5: consists of a single TS point: in front of the asterion landmark for T7.

Localizing Primary TS Active Point(s)

After "active" TS points are identified by General Screening within one of the TS screening groups, the next step is to further assess which is the most active point . The testing is the same as with group screening either using up to five pounds of palpation or Mind Language Testing of the specific TS points to find the most sensitive or reactive TS point.

The temporal sphenoidal reflex points on the skull have an associative point—sometimes two points—mapped to each spinal level. Rees also found two additional points, (1) the first rib which he found relates to body balance, and (2) the "toxic" point which he found related to imbalanced dural tensions affecting the foramen magnum and the atlas.

The following is Rees' assessment method of how to palpate the TS points as well as what he believed to be their related vertebral and visceral relationship.

TS Point	Organ Involvement	How to Locate
Group 1		
T12	Kidney (Except Pelvis)	Start on the TS ring, on the zygomatic process in front of the right ear canal.
T11	Duodenum, Left Kidney (Pelvis)	Start on the TS ring, one finger width anterior to the T12 landmark on the zygomatic process of the temporal bone.
T10	Jejunum, Ileum	Start on the TS ring, two finger widths anterior to the T12 landmark.
T9	Adrenal, Medulla and Cortex	Start on the TS ring, three finger widths anterior to the T12 landmark.
T8	Liver, Portal Circulation	Start on the TS ring, four finger widths anterior to the T12 landmark.
TOXIC	Foramen Magnum	Start on the TS ring, on the zygomatic prominence "V" indentation (just lateral to the lateral canthus).
Group 2		
L1	Ileocecal Valve	The L1 indicator is superior of T8 on the zygomatic process in front of the inferior aspect of the orbit of the right eye.
L2	Proximal 1/3 Colon	Start on the right TS ring, one finger width superior to L1 (at level of the middle of right orbit).
L3	Ovary/Testicles	Start on the right TS ring, two finger widths superior to L1 (middle of right orbit).
L4	Distal 2/3 Colon, Hemorrhoidal Plexus	Start on the right TS ring, three finger widths superior to L1 (middle of right orbit).

TS Point	Organ Involvement	How to Locate
L5	Uterus/Prostate	Start on the right TS ring, four finger widths superior to L1 (middle of right orbit) or one finger width inferior to the right frontal "V" indentation where the FIRST RIB point is located.
Group 3		
First Rib	Body Balance	Start on the right TS ring, on the frontal eminence "V" at the spheno-frontal junction lateral and superior to the right eye.
T1	Left: Coronary Right: Glandular Overfunction	Find the frontal eminence "V" at the spheno-frontal junction lateral and superior to the right eye. From the tip of the "V", go posterior one quarter inch, and you are over the T1 indicator on the TS line.
T2	Left: Myocardial, Valvular Right: Glandular Underfunction	Start on the TS ring, two finger widths behind the frontal eminence "V" at the lateral edge of the eyebrow.
T3	Lung Fields	Start on the TS ring, three finger widths behind the frontal eminence "V" at the lateral edge of the eyebrow.
T4	Bile Duct	The T4 indicator is located at the pterion.
Group 4		
T5B	Stomach Mobility	Start on the TS ring, one index finger width posterior of the pterion.
T5A	Stomach Secretions	Start on the TS ring, one index finger width posterior and inferior of T5B, following the auricularis anterior muscle to root of the ear.
T6B	Pancreatic Digestion	Start on the TS ring, exactly half way between T5A and T6A. When T6B reflex is active, it becomes quite painful to 5 lbs. pressure when palpated.
T6A	Pancreatic Insulin	Start on the TS ring, at the auricularis anterior muscle, where it attaches to the ear. The muscle is easily palpated under the skin as a slight "ropey" feeling, which goes from the ear in the direction of the pterion.
Group 5		
T7	Lymphatics/Spleen	Start on the TS ring, posterior to the ear, just anterior to the asterion landmark.

Alpha Wave Enhancement Technique

Once the most active TS point is located along with visceral manipulation and nutritional support, the Alpha Wave Enhancement technique was developed by Rees to help balance electromagnetic pathways between the CNS/ANS, viscera and spine. Alpha waves (one of the brain wave frequencies found between waking and sleep) are characterized by a calm, relaxed, yet conscious state. In the alpha state, the body recharges and rebuilds and appears closely related to increased parasympathetic nervous system activity. Dr. Rees found that patients could self-induce an alpha state by closing their eyes and rolling their eyes upward within closed lids. Other methods to increase alpha wave production described in the literature relate to having a subject perform relaxation or meditation exercises[12-13].

Ideally Rees believed that Alpha Wave Enhancement technique facilitates a patient's clinical response by incorporating a relaxation effect, stimulating parasympathetic activity, and inducing an alpha state in the patient with the goals of balancing bioelectric fields at the TS points, spinal level and related viscera[14].

Alpha Wave Enhancement Technique Protocol

Once the most active TS point has been determined, the related spinal segment balanced, and any needed visceral manipulation or chiropractic manipulative reflex technique (CMRT) procedure performed, then the Alpha Wave Enhancement technique can be utilized to complete the treatment as follows:

Step	Description
1	Contact the TS major indicator point with doctor's left index finger.
2	Have the patient close his/her eyes and then look upward inside the eyelids to initiate an alpha state.
3	With the right hand, contact the specific "entrance point" associated with the spinal major active TS point.
4	Once the patient goes into an alpha state, within 20 seconds remove your hands from the contact points and leave the patient alone for approximately 2 minutes. The increased alpha wave activity will facilitate improved visceral or viscerosomatic reflex function.
5	Instruct the patient that, prior to sleep, to put him/herself into an alpha state and then concentrate on or place his/her right hand on the "entrance point."

TS Entrance and Reflex Points

TS Entrance Points

According to Dr. Rees, each TS indicator can be a way of facilitating alpha wave production to affect "*organ entrance points at specific locations in the soft tissue of the body*." The entrance points are the contact points leading directly to the involved organ or viscera. The doctor uses his/her right hand on the entrance points to create a connection between the increased local alpha wave production to the involved organ.

The TS Reflex Points

Rees taught that the TS reflex points are a representation of the primary musculoskeletal symptoms for each spinal major syndrome as well as those that have a viscerosomatic or somatovisceral reflex relationship. Reflex areas become sensitive when a viscus has dysfunction sufficient enough to create afferent nociceptive stimuli. Ideally the TS points can be used as pre and post assessment tools as the palpatory tenderness should resolve following treatment.

Discussion:

Rees' methods were very novel and innovative for the 1960-1990s when he was teaching his various assessment and treatment modalities. Initially the TS points were a significant clinical breakthrough for him and those who studied with him. Regretfully while he performed extensive clinical studies to develop his methods of care he did not publish these in peer review journals. His methods were not studied for reliability or validity; however, the doctors who studied with him found that the patient's response to care was significant.

While Rees found that the TS points and "alpha wave technique" were helpful in patient treatment, it is important to determine if there is a biological plausibility to this assessment process. It is clear that more research will be needed to uncover this reflex relationship. If a theory for the TS points were to be considered, some questions to be answered include the following: Why are there "active" points located along the temporosphenoidal sutures? Why is there sensitivity at a specific point? What causes this sensitivity? And why does the pain reflex change with a therapeutic application?

Nerve fibers within the cranial sutures.

Anatomical animal studies have found nerve fibers within cranial sutures and this has been generally extrapolated to humans. A study using squirrel monkeys was performed by Retzlaff et al and found that both myelinated and nonmyelinated nerve fibers were present within the loose matrix of intrasutural connective tissue. Some of the fibers terminated as "branched free-endings along the inner periosteal covering of the free ends of the bones. These types of endings (Ruffini) are considered to be sensitive to pressure change and may produce pain sensations" to increased pressure[15]. In another animal study Retzlaff et al. showed the presence of nerve and vascular tissue large enough to supply intrasutural connective tissue. Nerve endings were traced from the sagittal suture to the neck[16].

Since there have been studies that noted that the inner periosteal dura penetrates the cranial suture connecting to the outer cranial bone periosteum[17] , it is not unreasonable to assume that, with the nerve fibers passing through the suture, a relationship may exist between the inner and outer fascial or meningeal structures. Various studies have found that the cranial dura mater is heavily innervated and likely sensitive to manipulation[18]. A rat study investigating extracranial innervation of meningeal afferents revealed mechanoreceptive fields both in the dura mater and the parietal periosteum. "Collaterals of meningeal nerve fibers project through the skull, forming functional connections between extra- and intracranial tissues[19-20]."

There are nerve endings and nerves within the intrasutural regions that project to extra- and intra-cranial tissues and are likely sensitive to pressure. Since this relationship may be present it would be interesting if there was also an autonomic nervous system relationship. In another study by Retzlaff et al they determined that the "arterioles of the dura and cranial sutures are innervated by non-myelinated autonomic nerve fibers which may be neuroscretory in function and effect vascular function. Free sensory endings are found in relation to the venous vessels as well as in the walls of the venous sinuses."[21]

Investigating temporalis muscle contraction Retzlaff et al noted that "the parieto-temporal suture is classified as a squamous type which permits the two surfaces to slide upon each other. Accordingly the nerve fiber and blood vessels will be compressed when the termporalis contracts. It is known that an area which is ischemic will become painful due to the local effect on the sympathetic (autonomic) perivascular plexus. Also the Golgi type IV sensory endings in the suture will be compressed, which will contribute to localized and more distant referred pain[22]."

Localized contraction of the temporalis muscle, such as what is purportedly taking place at a TS Point, may create a sustained point of sensitivity. Interestingly a study by Strassman et al on cats found that "medullary trigeminal neurons that receive convergent inputs from dura and facial skin may provide a physiological substrate for the cutaneous referral of dural sensation[23]."

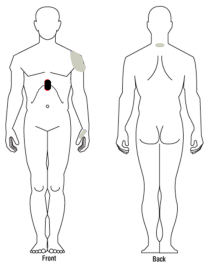
Another factor contributing to suboccipital or temporalis muscle chronic localized tension (TS Point) could be associated with our visual and vestibular righting mechanism. "Visual and vestibular input, as well as joint and soft tissue mechanoreceptors, are major players in the regulation of static upright posture. Each of these input sources detects and responds to specific types of postural stimulus and perturbations, and each region has specific pathways by which it communicates with other postural reflexes, as well as higher central nervous system structures[24]." Chronic viscerosomatic or somatosomatic reflex or referred pain patterns may create segmental changes in the regions of spine or within theoretical metameres related with that specific postural reflex activity. This persistent reflex could lead to spinal postural positions which could lead to posture induced myofascial accommodations in the suboccipital and temporalis muscle regions as a means to maintain balance visual and vestibular righting.

Entrance Point and Reflex Point Reference Diagrams

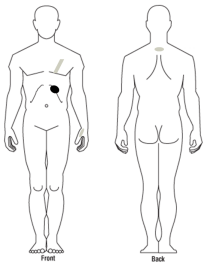
Key: **Black** = Entrance Point

Grey = Reflex Point

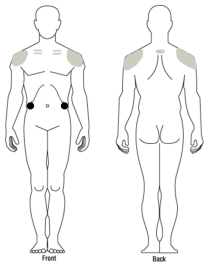
Thoracic 1: Left: Coronary - Right: Glandular Overfunction



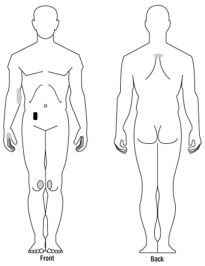
Thoracic 2: Left: Myocardial-Valvular - Right: Glandular Underfunction



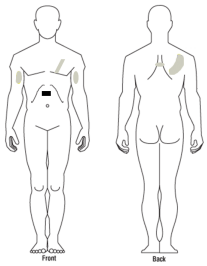
Thoracic 3: Respiratory Tract



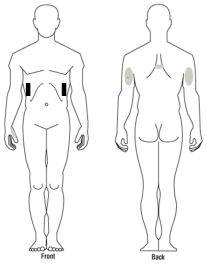
Thoracic 4: Bile Duct



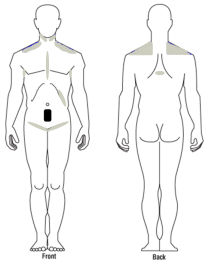
Thoracic 5: Stomach



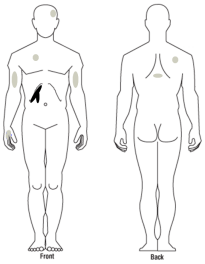
Thoracic 6: Pancreas



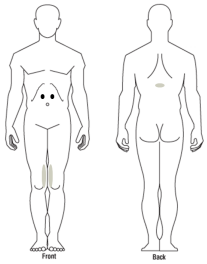
Thoracic 7: Lymphatic System



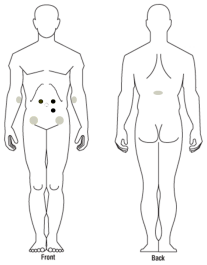
Thoracic 8: Liver



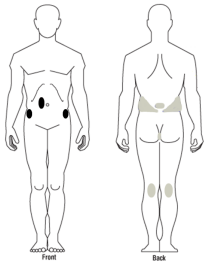
Thoracic 9: Adrenal



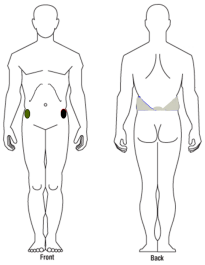
Thoracic 10: Small Intestines



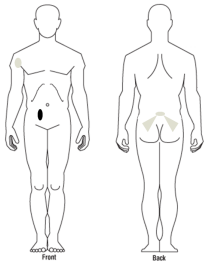
Thoracic 11: Duodenum, Kidney (Pelvis)



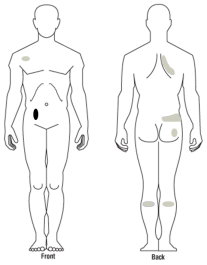
Thoracic 12: Kidney



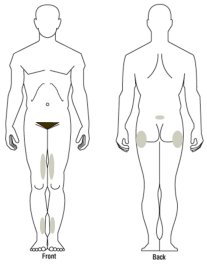
Lumbar 1: Ileocecal Valve/Jejunum



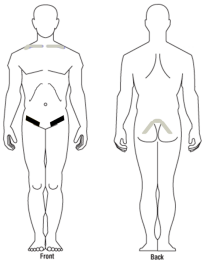
Lumbar 2: Cecum



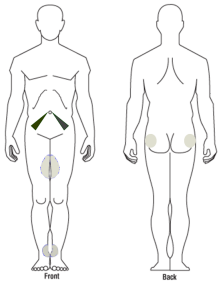
Lumbar 3: Ovary/Testicles



Lumbar 4: Colon Dysfunction



Lumbar 5: Uterus/Prostate



Milani and Roccia proposed, “Through the formulation of the dermatoneuromeric theory, an explanatory model for the understanding of the reflexotherapeutic results in the visceral pathology treatment.”[25] They suggested that there may be many different “points for the functional balance of the internal organs and consequent diseases, that these points are located in many cases on the same dermatomes and that these are connected with the starting neuromeres of autonomic fibers (Ortho and Parasympathetic) to the organ[25]” and consider that this relationship may have a spinal metameric reflexotherapeutic relationship with scanty modulation of the supraxial centers.

DeJarnette believed that pressure over the carotid sinus reflex could affect vagal function and that simultaneous contact over specific visceral reflex areas would stimulate local neural activity similar to “Hiltons Law” which considers the cutaneous tissue to be associated with underlying joint and connective tissue[26]. Likewise Rees attempted to find regions of the body that would stimulate parasympathetic activity. He also used the TS points as a way to stimulate alpha wave production.

The challenge is determining if a viscerosomatic reflex is able to affect a spinal segment and have a supraspinal relationship. Cervico found that “the number of nociceptive afferent fibers in viscera is very small but these few nociceptive afferents can excite many second order neurons in the spinal cord which in turn generate extensive divergence within the CNS, sometimes involving supraspinal loops[27].” He found that this divergent input can trigger several systems -- sensory, motor and autonomic -- creating “reactions that are characteristic of visceral nociception: a diffuse and referred pain, and prolonged autonomic and motor activity[27].”

It is postulated by Rees that a discrete form of visceral referred pain coordinated in a group of specific regions on the body as well as at the TS points. Procacci and Maresca suggested that specific regions of referred pain may be, “generally comprised in the same metameres[28].” They found that different pathogenic mechanisms may be involved in the onset of referred pain such as “convergence of impulses in the central nervous system and reflexes inducing muscle contraction, sympathetic activation, and antidromic activation of afferent fibers, which induces so-called 'neurogenic inflammation.'[28]” Benarroch also found that “Spinal and visceral afferents provide converging information to spinothalamic neurons in the dorsal horn and to neurons of the nucleus tractus solitarius and parabrachial nuclei[29].”

Other studies found descending central nervous system relationships between cerebral representations of somatic and visceral pain[30]. Bennarroch in another study considered how the nociceptive and autonomic systems functioned within an interrelated manner interacting “at the level of the periphery, spinal cord, brainstem, and forebrain[31].”

The relationship Rees found between a TS Point sensitivity and alpha wave production may be related to the intrasutural autonomics and parasympathetic activity. There are studies that have investigated the relationship between alpha wave production and autonomic nervous system (parasympathetic) [12]. Additionally, EEG activity during meditation or relaxation, a parasympathetic dominant period, is associated with increase alpha wave production. Not surprisingly Lagopoulos et al found “a significant increase in alpha power in the meditation condition compared to the rest condition, when averaged across all brain regions…[13]” It is unclear if the “Alpha Wave Technique” and TS Points create a meditative state that increases parasympathetic function, or a combination of other factors not yet discovered.

A relationship appears to exist within the central and autonomic systems affected by somatic and visceral afferent reflex pain which may have spinal and supraspinal effects. There may be relationships between cranial sutures, temporalis muscle, trigeminal reflex activity, postural righting reflexes and other factors leading to a possible explanation for the TS Points. At this stage in the study of this novel assessment and treatment modality, we are left with much more work to do before anything conclusive can be stated.

At this time the goal of those utilizing Rees methods is to begin the arduous task of developing an evidence base of literature. Presenting it in an historical manner is a beginning. However, critically evaluating Rees' assessment and treatment protocols is necessary to determine if there is a biological plausibility to his methods. Since reflexes and related treatments are difficult to study, it is important to report clinical outcomes comparing patient groups to controls or other types of interventions.

Conclusion:

The TS point assessment, as described by Rees, offers the doctor a rapid assessment of the health of the body using the network of relationships between the TS points, spine, viscera, and soft tissue. Through decades of clinical study Rees mapped out these reflex relationships and incorporated them into clinical care leading to positive clinical outcomes. He found that in addition to improving spinal segmental and related organ (viscerosomatic reflex) balance and function, that the Alpha Wave Enhancement technique was an integral process in aiding a patient's recovery. With this novel and complex manner of assessment and treatment, further study into its biological plausibility as well as determining its reliability and validity will be needed.

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Dental-Cranial functional model and the understanding of cranial facial distortions in dentistry: A Commentary.

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Introduction

The purpose of this presentation is to facilitate an understanding of cranial facial distortion (CFD) patterns as a reaction to compromised growth and development of the cranial facial structures, along with the results of these patterns on the whole body's kinematic chain. There are various factors that will be discussed which include cervical headgear (CHG) and its effect on craniofacial growth and development, the orthotropic paradigm, related sympathetic nervous system overload and stress, and suggestions for interdisciplinary treatment and prevention.

Cervical Headgear

Cervical headgear (CHG) has been most commonly used to treat anteroposterior (class II) malocclusions for over a century[1]. In its most common iteration, headgear attaches to the braces on the teeth via metal hooks or a facebow. Straps or a head cap anchor the headgear to the back of the head and/or neck. Elastic bands are used to apply pressure to the bow or hooks with the purpose of restricting maxillary growth so that the mandible is not too far posterior relative to the maxillary dentition. In general its purpose is to inhibit the upper jaw from growing, thereby preventing or correcting an overjet (maxillary incisors too far forward relative to the mandibular incisors).

While CHG may maintain an aesthetic maxillary and mandibular incisor positioning there are other secondary iatrogenic factors that many in the dental field have referred to as the "Head-Gear Effect" (HGE)[2]. The (HGE) causes a cranial facial distortion (CFD) associated with alterations in the growth and development of the facial structures and due those modifications in craniofacial growth and development compensations and distortions are subsequently developed throughout the entire musculoskeletal system. In order to better understand this phenomenon, the HEG's dental cranial relationship will need to be explored and discussed. As Isaac Newton noted there is always a cause and effect, an action and reaction[3]; in sacro occipital technique (SOT) terminology DeJarnette called this "resistance and contraction" (R+C) factors[4].

There is published literature that discusses the effect of cervical headgear on the cranial base and the convexity of the maxillary profile. Alió-Sanz et al noted that "cervical headgear treatment induced cephalometric flattening of the cranial base and a decrease of the angle measured from the anteroposterior relationship of the maxillary basal arch on the anterior cranial base[5]." Also Kirjavianen noted that "Cervical headgear treatment in Class II correction is associated with a decreased facial convexity caused by the restriction of forward growth of the maxillary A-point, while the rest of the facial profile, including the mandible, continue to grow forward at a normal rate[6]."

In traditional or orthodox orthodontic care, "headgear" conjures up an image of a child's face with straps that wrap around the head to some sort of metal bar that attaches to braces and mouth piece. As previously stated, the primary purpose of this is retraction and/or intrusion of maxillary teeth (pulling them toward the back of the head). Historically the orthodontic approach tended to focus on the belief that there are too many teeth (or the teeth are too big)

for the mouth. Protocol in traditional orthodontics recommends the extraction of four bicuspids[7] or premolars [8,9] to reduce crowding and make space so that they can then pull teeth together and straighten them.

However, there is significant concern amongst functional orthodontists that removing teeth can lead to various secondary issues aside from facial morphology[10]. For instance Broadbent noted that, “most occlusal "chewing" function occurs with the first molar and premolar teeth. It is reported that 90% of chewing function occurs at the first molar and bicuspid region. Physiologically oriented orthodontists must consider: soft tissue profile and facial esthetics, incisal misguidance (interference), narrow or constricted maxilla, underdeveloped or retruded maxilla, overdeveloped or prognathic mandible (Class III actual of effective condition relative to maxilla), crowding or displacement of teeth, and (TMJ) temporomandibular joints must be considered[11].”

The functional dental approach as described by Broadbent believes traditional orthodonture creates posterior pressure on the remaining six front teeth, maxilla, cranium, and compromises the airway space[12]. A primary goal of traditional orthodontics is helping the patient to achieve an attractive smile with straight teeth along with an improvement in facial aesthetics. These traditional orthodontic modalities utilized are predominately braces and sometimes headgear. While traditional orthodontic perspectives support their methods of treatment,[13] physiological based or functional dentistry questions the long-term effects of removing teeth.

Stack described how historically “providers of orthodontic services were solely concerned with esthetic/cosmetic considerations of the teeth. In more recent years emphasis has been placed on the interdigitation of the teeth in centric occlusion combined with the absence of occlusal interferences in sliding/gliding jaw movements with the teeth in partial contact with each other (protrusive, cuspid disclusion, etc.) [14].” He continued that, “still more recently true jaw function, or, function of the entire stomatognathic system, as opposed to the more limited functional movement of the teeth as influenced by their inclined planes when in partial occlusion, has come to the fore[14].”

So in conjunction with removal of teeth and use of headgear, the term “headgear effect” (HGE) has been used in dentistry to describe the “downward and backward growth” of the oral facial structures even without the use of cervical headgear. This pattern of growth and/or development in SOT cranial terminology would be called a “cranial facial distortion” (CFD), which can have a relationship to the cranial-sacral and the musculoskeletal systems as well as the oral facial structure.

Clinically it is believed that the CFD is associated with restricted or distorted growth patterns of the upper jaw inhibiting normal growth patterns, restricting upper arch width and/or length. Since the lower dentition will attempt to fit within the shape of the upper dental arch this upper arch restriction may lead to decreased growth and advancement of the lower jaw, commonly resulting in a narrowing and elongation of the face.

Orthotropic Paradigm

John Mew, DDS described a model of the growth and development of the oral facial structure which utilizes an “orthotropic” (growth guidance) paradigm[15]. According to Mew, treatment to straighten crooked teeth treats only the symptoms, not the cause Mew proposes this is the

reason there is commonly a relapse following completion of treatment. Often by removing teeth, this narrows and shortens the oral cavity ultimately hindering orofacial growth and development[16].

Orthotropic paradigm's orthodontic objective is to facilitate growth of maxilla up and forward versus down and back. Mew believes that some types of malocclusion are related to vertical growth instead of horizontal. He suggests that cases should be started by eight years old, since it is around that age that maxillary growth and its affect on the cranium is most optimally controlled [17]. Instead of aesthetics, Mew believes that the most important factor to focus care is to change (expand) the shape of the dental arch as a means to restore nasal breathing and eliminate mouth breathing. By reestablishing a more protrusive mandibular position, this helps bring the tongue forward opening the airway space therefore helping to optimize TMJ position and function[18].

Sympathetic Nervous System Overload and Psychogenic Stress

With the stresses or tensions associated with iatrogenically induced CFD and its affect on craniofacial growth, secondary effects such as temporomandibular joint disorders (TMD) and airway space compromise can create a cascade of clinical presentations. Research appears to have found a relationship between TMD and psychogenic or stress disorders[19,20] that are experienced by orthodontic patients[21].

From a chiropractic perspective it does seem reasonable to assume that stress to the craniofacial and cervical region could have an inhibiting factor on the parasympathetic system[22] due to its compromise on the craniosacral autonomic outflow. So it is not unreasonable to find clinically that TMD patients who have had orthodontic care presenting with a HGE/CFD would be challenging chiropractic patients to treat. Clinically, patients presenting with HGE/CFD often, due to chronic nature of their condition, tend to be difficult, sensitive and psychologically challenged, due to their heightened sympathetic response that leads to reduced coping skills. In fact, at times this subset of patients may be so sensitive that typical high velocity, low amplitude manipulations are not possible due to patient guarding, necessitating that treatment focuses on only passive or indirect manipulations. Once HGE/CFD patients can be separated into their own specific subset, then specialized care can be rendered, ultimately making them (as a group) easier to manage.

However, what appears interesting is that similar psychogenic stressed patterns have also been found with non-orthodontic patients. Therefore while TMD patients are often hypersensitive and psychogenically challenged, those with HGE/CFD-- particularly with dental extractions -- appear to have significantly stressed systems. HGE/CFD can be present in patients with TMD with or without the use of cervical headgear, though those TMD patients with HGE/CFD will tend to have a lower pain threshold[23,24] and increased fear avoidance behavior[25].

Wahlund et al compared adolescents [n=60] with chronic TMD to a healthy control group evaluating sensitivity to all types of somatic and emotional stimuli. In their study "the results showed that adolescents with TMD pain reported significantly greater sensitivity ($p<0.05$) to aversive somatic and pleasant somatic stimuli than the controls[26]." Their findings suggested "chronic TMD pain states in adolescents are accompanied by amplification of bodily, but not purely emotional stimuli and that cognitive systems are implicated, not only an alteration of the nociceptive systems[26]."

Airway Compromise, Head Posture, and SOT

Patients presenting with CFD patterns display a relationship between the upper cervical spine and chronic TMD or HGE affecting airway function. This was initially described by Casey Guzay's Quadrant theory, in which he determined that the forces of the mandible and the bite rotate around a point in the sub-occipital region in the cervical spine[27]. The lever action of the mandible and associated musculature create an inferior pressure, distorting the cranial sutures and dural membranes via the temporalis, masseter and pterygoid muscles. This also results in a tilting of the entire head forward and downward to help to open airway space, creating a forward head posture as a reaction and compensation. This attempt to maintain airway space, proper dental occlusion, condylar position, and tongue position can lead to sleep–apnea/open mouth breathing habits along with bruxism, parafunction, and grinding patterns[28].

The mechanics of the mouth breather is often related to the compromise of the airway and associated musculature in and around the mouth. The head, neck, and TMJ relationships tend to be more balanced with nasal breathing and with the lips closed (lip seal). Ultimately the pressure coming from outside the teeth (lips & cheeks) needs to match the pressure from inside the teeth (tongue) to maintain the maxillary dental arch. So, when the mouth is open a significant part of the day and/or night to breath, the tongue tends to not reside within the maxillary arch but more commonly in the lower mandibular region. With this lower tongue placement it will significantly decrease any upward and outward pressure on the maxilla and the lingual surface of the teeth, thus inhibiting the necessary craniofacial growth and development[29,30].

With mouth breathers, not only will the tongue not stimulate upper arch development but inward forces from the cheeks and lips will not be counter balanced, further causing the dental arch to "collapse" inward, down, and backward. This will lead to the maxillary arch becoming narrower, the palate becoming higher, and the maxilla will be restricted from expanding anteriorly or laterally. This maxillary arch restriction can be associated with craniofacial suture tension[31], trigeminal nerve irritation[32], and TMD changes leading to posture and compensations throughout the musculoskeletal system[33-35].

With mouth breathing patterns, bruxism and grinding can be an attempt by the patient to unconsciously find a way maintain good airway space and still have adequate dental occlusion. Airway space and proper dentition cannot adequately function independently, so when there is airway compromise or obstructive apnea the dentition is commonly challenged and results in clenching, bruxism, and parafunctional activities. This pattern is associated with the need for adequate oxygenation, excessive stimulation of pain receptors, and leads to increased systemic stress load.

From a clinical cranial SOT perspective, the CFD patterns associated with narrowing of the face and skull[5,17] keep the cranial system restricted (extension phase) and unable to release all the way into its flexion phase (inhalation). This restricted growth and development has a functional affect on the cranial suture system reducing cranial compliance, limiting cranial motion associated with CSF pulsations or cranial rhythms. With cranial motion limited, this can lead to an increased predisposition for the craniofacial and craniosacral systems to have cranial extension restrictions or fixations.

In SOT the narrow face and high narrow upper dental arch are associated with what is called cranial internal rotation or extension (SB+). The ability of the craniofacial and craniosacral system to enter into internal rotation or extension (SB+) and external rotation or flexion (SB-) allows for a balanced functional system[36]. This can have far reaching implications since cranial internal/external rotation or flexion/extension is associated with the ability of CSF pressure variants, pulsations, or fluctuations to be buffered as the cranium moves through increased and decreased pressure changes in response to these pressure variants[37]. Also the ability to have this craniofacial bone or suture flexibility allows muscular forces, most particularly associated with mastication, to be distributed throughout the craniofacial system and not focused at one point of muscle insertion. For instance, Buckland-Wright has noted that small movements have been observed between facial bones in animals, indicating the presence of a flexible component within the skull, thus allowing large forces to be exerted during biting without overstressing the facial bones[38,39].

In addition, cranial meningeal tensions are reflected to the sacral region via the pia (filum terminale) and dura (internal attachments at S2) so that the craniosacral system is responsive caudally to tensions found cranially. Therefore if the craniofacial system is restricted in only one phase of flexibility, such as extension, this may have an adverse affect on the functional motion at the sacrum, affecting sacral nutation (extension) and counternutation (flexion) [37,40].

This imbalanced sacral nutation is believed to have a physiological effect since normal sacral nutation plays an important role in CSF circulation from the lumbosacral cistern, cranialward[41]. Also it is purported that a stressed craniofacial craniosacral system may also lead so inhibition of parasympathetic nervous system activity. This reduced parasympathetic activity tends to lead to increased sympathetic stimulus[42] creating a persistent state of musculoskeletal tension[43] as an adaptive and compensating mechanism in the body.

So this HGE/CFD, airway compromise, parasympathetic inhibition, and other subsequent related physiological effects will over time create a multifactorial condition with secondary compensations or body distortions. The internal craniofacial tension caused by altered dentocranial growth and development can create increased stress in all of the cranial sutures while concurrently affecting the shape of the cranium. The muscle tension secondary to TMJ disorders or airway compromise increases tensions in the suboccipital muscle region, creating a forward head posture[28,44,45].

As this tension pattern persists it can lead to increased tension along the falx cerebri to the internal aspect of the frontal bone creating an inferiorward tension which transmits throughout all of the facial bones and sutures. The maxilla, zygoma, and mandible are under a craniofacial tension drawing the bones inferiorly, posteriorly, and medially. This starts a cascade of changes, beginning with increased muscle tension in muscles of mastication, compromised stomatognathic function, and a tendency for clenching and/or bruxism.

Clinically it has been found that the CFD subset of patients tends to have the following types of presentation:

1. Loss of cervical curve, increased forward head posture and increased tension in cervical musculature[28,44,45].

2. Suboccipital tension[27].

3. TMD/CMD (craniomandibular disorder) – symptoms[46,47].

4. Decreased lumbar curve and/or increased lumbosacral disc angle[48].

5. Unstable or dysfunctional sacroiliac joint[33,49,50].

6. Pain in feet and metatarsals, poor foot mechanics – collapse of arches[51,52].

7. Muscle tensions may be present in any of the areas mentioned above.

The narrow craniofacial with a high hard palate or extension distortion leads to a diminished nasopharynx cavity and reduced air flow and oxygenation. It also reduces and decreases nasal breathing, while increasing the tendency to mouth breathe and sustaining these vertical growth patterns of the oral facial structures. This tendency is perpetuated because the tongue has no ability to locate itself in the upper hard palate that is considered the tongue's physiological rest position. As the tongue rests downward it forces mouth breathing and subsequent retro-positioning of the mandible, or a dental class two position.

The basic concepts of proper craniofacial growth and development as described by Mew[15] or Chinappi[46] consider craniofacial and stomatognathic system as necessitating function to allow for proper physiology locally and distally affecting the whole kinematic chain. This relationship is far reaching since there appears to be airway compromise affecting oxygenation as well as increased sympathetic nervous system function.

Dental therapeutic interventions (orthodontic, restorative, etc.) from a physiological perspective need to consider growth and development, TMJ (occlusion and condylar position), airway passages, and stomatognathic function. If not, it is possible that they could contribute or cause some CFD patterns by not addressing whole-body relationships. Therapies have to consider the various stressors to the system, along with the myriad of secondary problems associated with apnea [53,54] and possible sympathetic overload[55,56].

The reduced oral cavity created by reduced size of the upper dental arch, lingual tipping of the mandibular dentition, retro-positioning of the mandible, and relative size and position of the tongue all creates airway compromise, reduced oxygenation, and excessive sympathetic nervous system stimulation. The musculoskeletal system will develop adaptive compensation distortions, and it is not uncommon for the patient to have increased fear avoidance behavior[25], low pain thresholds[57,58], and a limited physiological adaptive range[59].

Within the subset of patients with CFD, generalized pain can aggravate and complicate this pattern. The compromised airway and oxygenation along with sympathetic stimulus will eventually overload the patient's physiologic adaptive mechanisms. Ultimately the body will attempt to compensate and adapt to the imbalanced stressors until it begins to fail. As the body begins to fail to compensate there will be alteration in sub-optimal posture, compromise of musculoskeletal function, osteoarthritis, degenerative joint diseases, decreased flexibility or joint hypermobility, as joints are challenged muscles will increase tension to maintain support, and lowered pain thresholds leading to generalized pain syndromes.

Therapeutic Interventions

There are various methodologies available to deal with CFD associated with HGE or poor growth and development. One aspect can be incorporating dentistry and chiropractic (SOT cranial techniques)[47,60] preventatively to facilitate a child's growth and development allowing for upper dental arch development and good orofacial behavior. From a dental perspective this incorporates focusing on upper dental arch expansion, leading to optimal dental occlusion, good condylar position, and appropriate tongue to oral cavity space and function. It is not about a focus on removing teeth (bicuspids) or using head gear to retroposition a mandible[61].

Chiropractic (SOT cranial) care is focused on maintaining good anterior sacroiliac joint (sacral nutation – category one) motion and posterior sacroiliac joint (weightbearing ligamentous integrity – category two) support. Assessment and treatment is directed to the whole body kinematic chain from an ascending (feet, knees, hips, pelvis, spine to craniofacial and TMJ regions) as well as a descending (TMJ, craniofacial, spine, to the pelvis) orientation[62,63]. SOT craniofacial treatments facilitate growth and development, improve TMJ function, and help integrate these changes into the patient's entire neuromusculoskeletal kinematic chain[47,60, 62-65]. Autonomic nervous system balance is important and can involve balancing viscerosomatic/somatovisceral reflexes to help the patient cope with any sympathetic nervous system overload of parasympathetic nervous system inhibition[66].

Oral myofunctional therapy (OMT) can be incorporated into care with resistant TMD and CFD cases[67,68]. OMT involves a neuro-muscular re-education of the oral facial muscles, is a modality that promotes the stability of the stomatognathic system. OMT treatment commonly consists of jaw stabilization exercises, habit elimination and behavior modification, and re-patterning the oral facial muscles and changing their function for optimal tongue rest position, chewing and swallowing so that the tongue does not drop into the airway[69,70].

The interdisciplinary relationship between the dentist, chiropractor and OMT therapist incorporates myofunctional aspects regarding internal and external pressures to the dental arch and its affect on function and growth and development. For instance the pressure pushing out on the dental arch from the tongue is supposed to match pressure pushing inward from the lips and cheeks. With a mouth-breathing patient, their mouth is open a large part of the day and night due to the lack of ability to get enough oxygen through the nasopharyngeal and this position allows the lips and cheeks to have a slow consistent long term sub-optimal effect on the dental arch. With a mouth breather it is found clinically that the tongue does not press into the maxillary arch, and so this arch slowly collapses inward, backward, and down or a combination of these distortions. This pattern becomes persistent since when the tongue is not in it physiological rest position (upper dental arch) aside from growth and development being affected the back of the tongue closes off the airway space leading to airway compromise.

Another preventative factor that can be investigated is the use of nutrition to facilitate proper stomatognathic function and dental growth and development This was studied in animals by Pottinger. Pottinger demonstrates in his book "Pottinger Cats[71]." how a compromise in the developmental patterns of cats can be attributed to moving away from raw to cooked food diets. Pottinger found that cats moved from raw to cooked food diet had a significant loss of teeth, poor dental arch development, swollen organs, fertility, hair loss, skin problems, and significant behavioral changes[71]. Pottinger also, through radiographic study, noted a

relationship between mandibular underdevelopment and microtrauma and fracture in the feet suggesting a possible relationship between these distal osseous boney structures[71].

In humans, this concept is further investigated by considering "developmental nutrition[71]."Developmental nutrition as discussed by Price in his book "Nutrition and Physical Degeneration" examines how diets of processed food can significantly alter oral facial structure as well as general development. Price, a dentist, performed anthropological studies in the 1930s traveling globally and studying the diets and nutrition of various cultures. His book concluded that aspects of a modern Western diet (particularly flour, sugar, and modern processed vegetable fats) cause nutritional deficiencies that are a cause of many dental issues and health problems. The primary dental issues he observed from a "modern Western diet" included the improper development of the facial structure (overcrowding of the teeth) in addition to dental caries[72].

Conclusion

The significance to dentists and cranially trained chiropractors or osteopaths is the realization that there is a common pattern of compromised craniofacial growth in a subset of our patients. Looking at the body as a matrix of structure and function, with the dental growth and development, airway, and autonomic nervous system balance as integrated aspects of a patient's health, can be an essential aspect of healthcare treatment or prevention. This concept of a comprehensive, whole body approach to diagnosis and can facilitate the treatment of myriads of problems that are seen clinically.

Examples can be patients presenting with migraine headaches, teeth grinding, bruxism or clenching, TMD/CMD, tinnitus, vertigo, general loss of strength, chronic fatigue, snoring, sleep apnea, low pulse oxygen levels, and loss of cervical curve or forward head posture. It is not uncommon to find with the CFD subset of patients cervical and lumbar muscle tension from the resulting compromised or compensatory posture, predisposing them to thoracic outlet syndrome, carpel tunnel syndrome, and other upper extremity type disorders. Therefore these patients may have interrelated disorders throughout their entire neuromusculoskeletal system and kinematic chain.

Ideally the future for these patients will be more hopeful if interdisciplinary relationships can be developed between dentists, chiropractors, osteopaths, OMT, podiatrists, nutritionists, and other healthcare practitioners. The ultimate goal is to improve dental or craniofacial growth and development as well as airway space, and reduce related secondary apnea or upper airway resistance syndromes and excess sympathetic nervous system activity. This field of study and care should warrant significant further research since it may represent a large, understudied portion of our patient population.

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Sacro occipital technique (SOT) cervical protocol: analysis, adjustment and assessment: A retrospective case series [n=48].

Harvey Getzoff DC

Introduction

The intent of this paper is to present sacro occipital technique (SOT) methods of and rationales for analysis, adjustment, and assessment for patients experiencing cervical pain and dysfunction. A non-randomized retrospective sequential review of patient records at this chiropractic office [n=48] with presenting symptoms in the cervical spine was included in this case series review. The purpose of the assessment portion of this paper is to be able to measure incremental improvement as well as to be able to state, to the patient, the initial expectations of the outcome.

SOT chiropractic is based on identifying which of three functional systems, called Categories, is most in need of adjustment. Major Bertrand DeJarnette DO, DC, the founder and developer of SOT chiropractic says "to bring order out of chaos SOT offers the category system of analysis."[1] Cervical spine-related problems and findings do not dictate the SOT category. Each of the three SOT categories is defined by SOT indicators, but each Category allows for cervical analysis, adjustment, and assessment within its framework. DeJarnette further states "SOT views the cervical column as part of the total and is responsive to that which helps the total respond." [1] The three SOT categories are primary systems of the body, each clinically definable, but at the same time interrelated.

Category one is related to the Primary Cranial Sacral Respiratory Mechanism (PCSRM). "The PCSRM is a system of harmonious functional units that allows the Central Nervous System to be nourished and protected by cerebral spinal fluid as it regulates and coordinates function throughout the body." [2]. A key functional unit of the PCSRM is the tension on the dural system. DeJarnette writes that "The constant pumping (of CSF) essential to health is done by the dura." [3]

Category two is the ability of "the weight-bearing system of the body, inclusive of the head righting reflexes, to fully communicate through the nervous system (sensory input and motor response) so that maximum weight-bearing function can occur as the structural system operates within the demands of a gravitational environment." [2] DeJarnette contended that "cranial suture dysfunction altering head posture can be reflected throughout the entire postural system".[4]

Category three primarily deals with subluxations of the lumbar spine, along with local tissue responses and the compensating nature of the pelvic structures and the cervical spine. DeJarnette determined that "specific cervical responses to specific lumbar subluxations enabled practitioners to make specific lumbar listings." [2]

Methods/Intervention

A review of patient records isolated 48 patients who presented at this chiropractic office with cervical spine symptoms as their reason for seeking chiropractic care. Two of the patients were identified as category one, 32 as category two, and 14 as category three. Six of the 48 reported upper extremity radicular symptoms, with all six also determined to fit category two

criteria. All patients were treated with SOT category analysis and treatment along with cervical stairstep assessment and adjusting. Each subject was advised about proper homecare of the cervical spine, which involved stretching, strengthening, and ergonomic modifications when appropriate.

Cervical range of motion tested for flexion, extension, right and left rotation and right and left lateral flexion. It was performed by standing behind the seated patient and gently assists the patient to make these movements while maintaining no shoulder movement. A flexometer was used initially to record the exact range of motion. Of the 48 patients observed six had difficulty with extension (chin up), 27 had difficulty with flexion (chin to chest), 46 had difficulty with at least one direction of rotation (chin to shoulder) and 43 had difficulty with one direction of lateral flexion (ear to shoulder). The standards measured in degrees used are flexion 50 degrees, extension 60 degrees, lateral flexion 45 degrees, and rotation 80 degrees.

Results

Of the 48 patients studied, improvement of range of motion function was noted in all 48. Each subject was adjusted at least five times within a six-week period. Of the 48 patients studied 46 had rotational limitation and 43 of them had cervical lateral limitations. Of the 48 patients all but three reported a decrease of cervical pain and a return to full activities of daily living.
Those three patients that did not report a significant decrease in cervical pain within the 6 week period and had reported upper extremity radicular pain were radiographed and spur formations along with other degenerative findings were noted on their x-ray report.

Discussion

SOT cervical techniques (stairstep and figure 8) are designed not only to adjust the cervical spine, but also to continually analyze and assess the technique's progress during the adjustment. DeJarnette notes that utilizing the stairstep and figure 8 adjustments "these particular cervical techniques combine analysis and corrections."[5] DeJarnette further stated that "there are many neurological and orthopedic tests that have value in making a detailed study of the cervical spine and you should be familiar with all or some of them."[1] Rene Cailliet, MD states in his book on "Neck and Arm Pain" that "pain in and from the neck results from the mechanical factor of encroachment of space and impairment of motion."[6]

Assessing Cervical Range of Motion

Figure 8 and stairstep in conjunction with seated cervical range of motion testing, as previously described, can be used to detail cervical movement limitations. To further identify areas of encroachment of space, the patient is still seated with the doctor standing behind them. On the side opposite rotational limitation (in this example, right rotation), with the left hand turn the patient's face far to the right, and with some pressure with the right thumb on the patient's posterior right facet plane C1/C2, feel for resistance. "The posterior facets are in opposition and so placed in direction and degree of inclination as to permit and guide the movement of two adjacent vertebrae."[5]

The doctor continues down the cervical spine feeling for the most resistant level before repeating on the opposite side. This procedure is referred to as cervical motion palpation. This method helps identify areas of cervical facet space encroachment and loss of movement that are consistent with the subluxated level identified in the stairstep procedure. An advantage of doing cervical sitting analysis is it allows for study of the neck in weight-bearing conditions. A typical diagnosis used for the above-described restrictions would be cervical right rotation limitation with restriction at C4/5 on the left (RR 60 C4/5L).[7] This area and this spinal level are emphasized in the stair step and figure 8 adjustments. "The stair step will point to the non- movable cervical motor unit. Stop at that unit and do the cervical figure 8."[1]

Difficulty in executing the figure 8 is indicative of a possible pathological problem. Cailliet states that "the pathological changes resulting from the irritated tissues must be ascertained as removable, reducible, or irreversible so that the maximum relief of symptoms, the greatest degree of reversal of the pathology and the utmost in prevention of progression or recurrence is obtained."[6] These methods (cervical stairstep and figure 8) appear to be not only analytically specific and effective adjustments, but at the same time allow for assessing the outcome in conjunction with range of motion and motion palpation findings.

Cervical Stairstep Adjustment

Keep in mind that cervical analysis and adjustment are done within the context of the Category most in need of adjustment. As DeJarnette states in his 1980 SOT book, "We begin our cervical analysis as part of all examinations to see which Category a patient is to be placed in for proper procedure."[1] Therefore the stair-step [Figure 1] and figure 8 [Figure 2] are to be done in the following manner as part of a standard SOT examination and, ultimately, as part of the SOT adjustment. In performing the analysis and adjustment, the doctor is seated at the head of the table with the patient supine and places a hand to the each side of the patient's skull. The index and middle finger are above the ear with the remaining two fingers below the ear. The patient's chin and forehead must be kept level as the doctor "puts inferior pressure through the cervical spine toward the feet."[1]

Figure 1. The cervical stairstep assessment method.[10]

"There are 4 distinct movements up, the chin (and forehead), going a little higher each step. The cervical vertebrae move in pairs (motor units) beginning with T1/C7, then C6/5, then C4/3 and C2/1."[1] The level where the head resists elevation is considered the level of subluxation and the area where the figure 8 is to be concentrated. DeJarnette describes the Figure eight adjustment as follows. "The skull is held as for the stair-step and is simply a continuation of the stair-step where it failed to make the two vertebrae stop. Holding in this

position so the figure 8 motion localizes at the involved area, you execute a side bending and the a rotation motion to comply with the movement involved in making a figure 8 … right and left side bending and then right and left rotation. Combine these two movements and you accomplish the figure 8 technique." [1] Inferior pressure is maintained throughout to continually engage the motor unit.

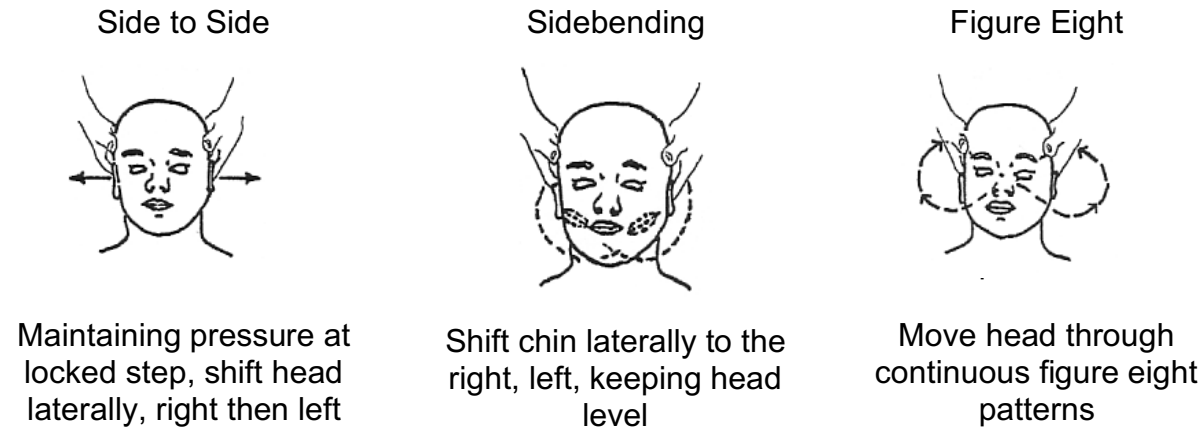

Figure 2. Cervical stairstep corrections, the figure 8 cervical adjustment.[10]

DeJarnette felt that "the figure 8 is the ideal cervical technique as it involves no violent motions or thrusting forces, rather a gentle controlled motion to reset the processes of the loosened cervical motor units by aligning the facet planes." [5] He also felt "that 95% of all cervical subluxations are facet plane lateralities or rotations." [5] It is likely that often both exist at the same time. As previously stated, of the 48 patients studied 46 had rotational limitation and 43 of them had cervical lateral limitations.

Cervical Spine Assessment and Patient Guidance

In the context of this paper, "assessment" refers to two important principles in the care of patients experiencing cervical pain and/or dysfunction. These two principles can even be applied to all types of health problems that are presented to chiropractors. As previously stated in this paper, Cailliet remarked that "irritated tissues must be ascertained as removable, reducible and irreversible." [6] Cailliet further stated that "a condition must be anatomically localized, mechanically understood and pathologically classified." [6] With this in mind chiropractors can utilize range of motion techniques, motion palpation, and stair-step and figure 8 techniques along with x-ray and MRI studies to determine the expected outcome (removable, reducible or irreversible) [**Principle #1**].

By localizing, understanding, and classifying, one can not only define expectations but also monitor progress from adjustment to adjustment [**Principle #2**]. All of this information can be communicated to the patient not only at the initial office visit but also at each subsequent adjustment. These actions can set the boundaries (treatment plan), expectations and goals of each case presented. These principles appear to have roots in the very beginning of Chiropractic. DD Palmer stated in his book "The Chiropractor's Adjuster" that "Diagnosis is the act of recognizing disease and from its symptoms deciding as to its character; what lesions have occurred and will occur, how long it will endure and what will be its probable

outcome." [8] DD Palmer also noted "The medical man prescribes remedies for the treatment of effects. The Chiropractor adjusts the cause of deranged functions." [8]

Cervical analysis and adjusting within the SOT category system can allow for a specific response to a specific cause while the cervical spine responds to the improved function of the system (category). Category 1 appeared to help improve dural membrane tension at C1, 2 and 3, category 2 reduced cervical responses to improved head position, and category 3 reduced cervical reactions to improved lumbar subluxations[9]. Stairstep and figure 8 techniques have been found clinically to help adjust and analyze cervical spine function simultaneously. Range of motion and motion palpation techniques allow for further analysis and assessment in a weight-bearing condition. All of this data along with x-ray and MRI findings can help bring about more improved and appropriate case management. Further study into the exact effectiveness (subjective and objective) of the stairstep and figure 8 adjusting methods relative to other Chiropractic cervical adjusting techniques could be very helpful. Age can be a significant factor in cervical problems and should be considered in further research of the effectiveness of cervical techniques.

Conclusion

Utilizing SOT category system analysis and cervical stairstep assessment and treatment may offer chiropractor the ability to reproducibly assess, treat, and reassess patients for improvement in cervical articular facet intersegmental and overall cervical range of motion. The majority of patients [n=45] in this retrospective case series showed increases in cervical range of motion and reduced pain. Of the three patients who's cervical pain did not resolve within the six week period they were found, following x-ray, to have complex cervical joint osteoarthritic conditions. Greater studies with controls and comparative therapies should be performed to better determine the efficacy of using SOT category and cervical stairstep analysis and treatment with patients presenting with cervical pain and decreased range of motion.

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Gastroesophageal reflux disease (GERD) and sacro occipital technique (SOT) chiropractic: A case report.

Harvey Getzoff, DC

Introduction

The intent of this paper is to study the Sacro Occipital Technique (SOT) chiropractic care of a patient experiencing a sore throat, heartburn, and difficulty swallowing along with various digestive symptoms such as cramping, bloating, and stomach pains. This patient was medically diagnosed and treated for gastroesophogeal reflux disease (GERD). GERD is defined as a "chronic symptom of mucosal damage caused by stomach acid ascending from the stomach into the esophagus … Common symptoms of GERD are heartburn, regurgitation and pain with swallowing."[1]

GERD is usually caused by changes in the barrier tissue between the stomach and the esophagus, the lower esophageal sphincter. Diaphragmatic imbalances adversely affect this sphincter, which normally holds the top of the stomach closed, preventing acids in the stomach from traveling back into the esophagus where they can cause burning and inflammation of the sensitive esophageal tissue. "GERD is a condition where the acid in the stomach washes back up into the esophagus."[2] "Since the esophagus lacks the protective lining of the stomach it is easily irritated by digestive juices."[3]. The diagnosis is usually made based on patient presentation and symptomatology.[1,2] The medical treatment for GERD includes lifestyle modifications, medications and possible surgery. Initial medical treatment is frequently with a proton pump inhibitor such as Omeprazole (Prilosec). "Omeprazole is used to treat certain conditions where there is too much acid in the stomach. It is used to treat gastric and duodenal ulcers, erosive esophagitis and gastroesophageal reflux disease (GERD)."[2] This paper studies a successful outcome of a patient experiencing the effects of GERD that was treated by SOT chiropractic methods.

Case Study

Assessment/Considerations

A 43 year old female patient, presented on August 7, 2012 experiencing a sore throat, heartburn, difficulty swallowing, and various digestive symptoms such as cramping, bloating, and stomach pain. She also reported predominantly left-sided neck pain with bilateral upper back pain and seasonal allergy symptoms. The patient was regularly taking Omeprazole (Prilosec) (for 2 months) and Xanax for clinical anxiety, along with over the counter allergy medication as needed. The patient consumed a gluten and diary free diet. All symptoms were chronic, more pronounced, and inhibitory over the last four years, even with diet modifications and medical intervention. An ultrasound examination was performed four months prior to her initial visit to the office, but revealed no abnormalities. The patient expressed a deep concern for her inability to fulfill her role as a mother and part-time occupational therapist due to her symptoms.

An examination, with an emphasis on SOT methods of analysis, was performed.[4-9] While standing in front of a plumb line on a fixed foot plate with eyes closed, the patient had lateral motion, a dominant left Thoracic 1/first rib finding[4-9], a left lateral spinal curve, and head

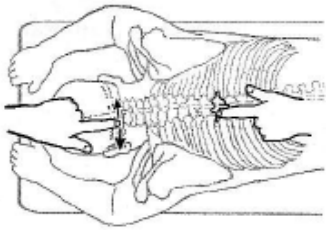
position was tilted to the right of the plumb line. In the prone position there was tenderness and tension at the thoracic 5 vertebrae along with a line 2 area 3 occipital fiber.

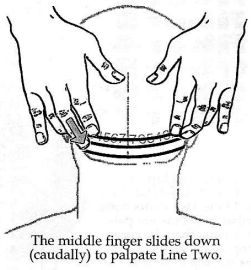
According to DeJarnette, occipital fibers are considered to be "defensive," reacting in a reflex pattern associated with the spinal subluxation and a related organ. "Occipital fiber technique locates and adjusts subluxations can be utilized to help identify specific viscerosomatic/somatovisceral reflex organ reflex disorders, while incorporating specific soft tissue therapies. This system allows for the management of dis-ease while providing a philosophy of care."[4-8, 10-13]

A line 2 occipital fiber 3 with a thoracic 5 subluxation identifies a gastric reflex problem.[10-13] In the supine position, there was a right leg deficiency with a left lower arm/fossae finding.[14,15] The arm/fossae test finding denotes the response of the arm when placed in a specific upright position and pulled on command while placing simultaneous pressure on the inguinal ligament. This ligament receptor system responds to disturbances at the sacroiliac joint. Therefore, this test is associated with the stability of the weight-bearing portion of the sacroiliac joint, which is primary in identifying an SOT category 2 condition, resulting from an instability of the body's weight-bearing system.[14-16]

Also identified in the supine position were cervical[17,18] and cranial range of motion limitations.[19,20] All of these findings were interrelated; systems oriented and addressed the patients concerns. Given the non-invasive nature of an SOT adjustment, it was determined that with SOT treatment subjective and objective improvements to her GERD presentation were possible at a low risk to the patient.

Occipital Line	1	2	3	4	5	6	7
Thoracic	1.2.1	3.11.	4.5	6	7	8	9
Lumbar			1	2	3	4	5
Sacral			1	2	3	4	5





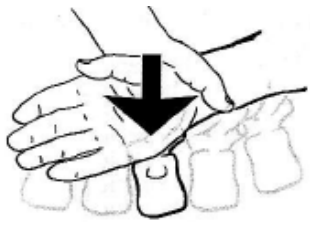


Figure 1. Occipital fiber line two chart, occipital fiber palpation, neutralization, and vertebral adjustment.[34]

Treatment/Intervention

SOT category 2 adjusting methods were utilized, inclusive of SOT blocks[4-9,16], cervical stair step and figure 8 adjusting[4-8,17,18], and cranial suture adjusting primarily at the right maxillary malar suture.[19-21] Incorporated into the SOT category 2 adjusting method was the Line 2 Occipital Fiber Technique, Thoracic 5 line 2 adjusting, and SOT Chiropractic Manipulative

Reflex Technique (CMRT).[13,22,23] [Figures 1 and 2] No additional dietary changes were discussed.

Because her sore throat, swallowing and heartburn were a primary concern, the patient was advised as to the method of voluntary swallowing. "When the food is ready for swallowing it is voluntarily squeezed or rolled into the pharynx by pressure on the tongue upward and backward against the palate. From here on the process of swallowing becomes almost entirely automatic."[24] The patient was advised to swallow each bolus of food and each gulp of water as if swallowing a large pill in order to develop the voluntary swallowing reflexes. Basic findings were analyzed at each adjustment and compared to the previous adjustment to note changes. All homecare advice and subjective and objective improvements were discussed - when the patient presented for subsequent adjustments.

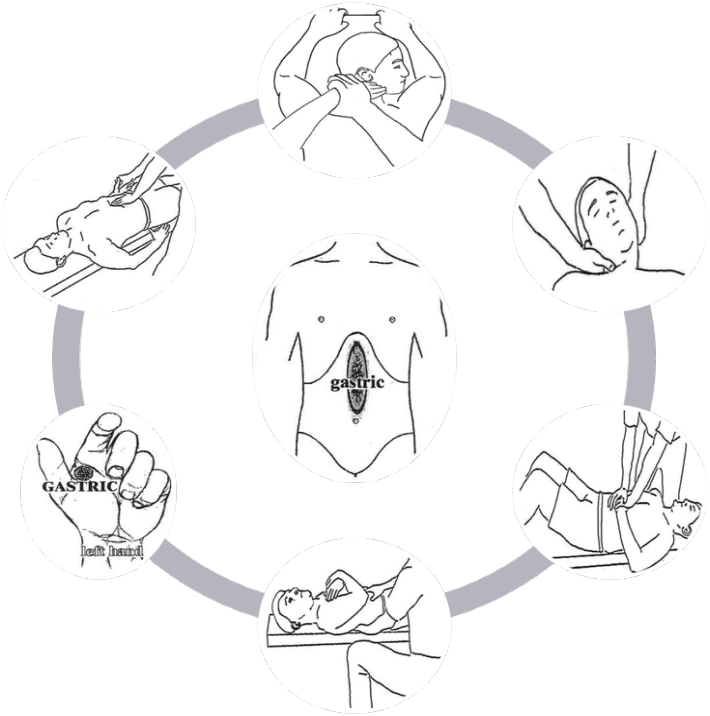


Figure 2. CMRT care for T5 – Gastric presentation.[34]

Results

Cranial adjusting, cervical adjusting, and category 2 blocking along with specific cervical home care instructions improved both the cervical ranges of motion and helped reduce the level of cervical pain. Measured cervical right rotation initially at 80 degrees improved to 90 degrees. The line 2 occipital fiber, the associated thoracic vertebrae (T5), and the anterior soft tissue reflexes were still present, yet were less sensitive to palpation, according to the patient. All GERD related symptoms were greatly improved. The patient-instituted dietary changes were continued, as was the swallowing exercise.

As she improved symptomatically she chose to eliminate the medication (Prilosec) and replace it with a digestive enzyme containing hydrochloric acid. She achieved all of these effects over a two month period during which she received 13 adjustments before transitioning to a monthly maintenance treatment regimen. Presently, 16 months after her

initial visit, she is symptom–free receiving chiropractic care once per month, adhering to her diet and enzymes, performing her swallowing exercises, and continuing her cervical spine homecare activities. Her improved findings have all been maintained. The patient realizes that the continual management of her condition is necessary even though her symptoms have dissipated.

Discussion

The standing examination, on a fixed foot plate with a plumb line, is part of the SOT analysis that helps determine which of three functional systems (called categories) is in primary need of adjustment.[4-9] With the eyes closed, lateral motions in excess (instability) and unilateral differences at the thoracic 1/first rib connection (the body's struggle to gain stability) are SOT indicators for category.[4-9,16] "Category 2 is a breakdown of the body's ability to function in a weight bearing environment."[4-9,16] The instability of the body's primary weight bearing structure, the sacroiliac joint, along with head posture and cranial suture restrictions in range of motion testing further identify the category 2 failure.[4-9,16]

Sacroiliac instability can be determined by the Arm/Fossae test, which purportedly challenges the sensory input to the upper motor system and the subsequent response of the lower motor system at the anterior pelvic inguinal areas (areas sensitive to sacroiliac disturbances).[14,15] The sacroiliac joint is adjusted with SOT pelvic blocks.[4-9,16] The arm/fossae test determines the need for the blocks. The leg length discrepancies in conjunction with the arm/fossae test determine where the blocks are placed.

The cranial suture dysfunction[19,20] often initiates disturbances in the head righting reflexes that can create imbalances and instability throughout the body.[25] Cervical dysfunction can occur in any SOT category breakdown[16,26,27], so it is crucial to maintain sacroiliac joint stability with a category 2 patient due to the pelvis or spine's relationship to cranial head posture.[28] In this particular case it is of extreme importance because of its relationship to the parasympathetic nervous system (Vagus Nerve), which plays a role in digestion.[24] Head posture along with cranial cervical ranges of motion improved. SOT cervical adjustments (figure 8 and stair-step)[17,18] mobilized the cervical spine to regain right rotation.

SOT cranial suture adjustments, maxilla rotation, straddle and suture release, in conjunction with the malar (zygoma) adjustment and lift were utilized to expand the maxilla/malar suture contraction.[19-21] Generally, suture expansion on respiration is functional while contraction is dysfunctional.[19-21]

The occipital line 2 area 3 fiber in conjunction with palpation tenderness of a transverse process of thoracic vertebra T5 and the anterior reflexes all became less tender and sensitive as the adjustments proceeded. Clinically this is found associated with improvement of gastric function.[29-32] The occipital fiber is stimulated by rubbing, the T 5 finding is adjusted for a posterior transverse process, the anterior reflexes (CMRT) consists of left thumb web stimulation while maintain a light touch to the contacted abdominal tissue.[22]

This occipital fiber technique is a diagnostic and treatment system, incorporating Golgi tendon organ reflexes located on the posterior occiput. Dr. DeJarnette found that occipital fibers reacted to spinal cord pressures which were responding to neurologic disturbances at specific regions of the autonomic nervous system (ANS). This imbalance in ANS activity

causes a compensatory somatic reflex at the spinal segment involved. Line 2 therapy uses a finger stoke to the involved fiber and a posterior to anterior transverse process adjustment to the related vertebrae. This sets the stage to establish pre and post-ganglionic reflex control using soft tissue visceral manipulation (CMRT).[13,22,23]

Along with the care rendered the patient had home activities and ergonomic modifications. She performed these activities by maintaining her diet modification as well as the swallowing exercise and cervical homecare (sleeping, reading, television watching, and computer work postures) which helped sustain improvement and reduce the chances of her condition returning.

Conclusion

This case discusses the chiropractic care of a patient who presented with symptoms diagnostic of Gastroesophogeal Reflux Disease (GERD). SOT category 2 chiropractic, as developed by DeJarnette, assessments and adjustments were used along with specific homecare modifications. The patient showed a great amount of determination and responsibility, which was a significant factor in the success of her recovery. Since the symptoms and the examination findings that determined the diagnosis have dissipated, it appears that the interventions as presented in this case study were successful. Because this is a singular case study with no controls or comparisons, it is inappropriate to draw conclusions for the greater population that experiences GERD symptoms. However, this case study's method of clinical care could be useful in the management of patients with GERD symptoms. Further research and study is needed into the role of the interventions studied in this case report.

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Chiropractic – preventative and wholistic care: Two representative case reports.
Michael Kooby, DC, Charles L. Blum, DC

Introduction:

There have been calls for in implementation of socialized medicine within the United States [1]. Now in 2014 with the implementation of the Affordable Care Act ramifications for the future of health care in the United States is anticipated [2-4]. Some suggest that participating doctors and hospitals will be bound by procedures which ultimately may pose cost above patient care. For many years, the medical profession has relied on expensive testing to arrive at a diagnosis, and currently insurance companies are cutting back on diagnostic testing in order to save money. Wait time will likely continue to increase from the time when a patient enters into a doctor's office with a complaint until that patient is approved by an insurance agency for diagnostic testing. Delays in treatment, coupled with a system that cannot financially sustain itself may encourage or force a significant percentage of patients to seek care outside of their insurance coverage with the hopes of regaining their health more expediently [5].

Yet it may be possible that since the 2010 Affordable Care Act provides incentives for both patients and providers to engage in evidence-based clinical preventive services recommended by the United States Preventive Services Task Force (USPSTF), the chiropractic profession could participate in primary care settings dealing with offering patients healthy options. It is therefore essential that a chiropractor's training prepare them to competently deliver these preventative services [6].

Difference groups within the chiropractic field may be better suited to contribute to this expanded chiropractic preventative health arena. For instance, using an international convenience sample of Sacro-Occipital Technique (SOT) practitioners, 1316 consecutive patients attending 27 different chiropractic clinics in the USA, Europe and Australia completed a one-page survey on intake to assess reason for seeking care. A forced choice response was obtained, characterizing the patient's reason for seeking chiropractic care. The study found that more than 40% of chiropractic patient visits were initiated for the purposes of health enhancement and/or disease prevention. While the study's findings need to be viewed cautiously and on a limited basis, it at least supports arguments related to consumer demand for a more comprehensive paradigm of chiropractic care, beyond routine musculoskeletal complaints, that conceptualizes the systemic, nonspecific effects of the chiropractic encounter in much broader terms [7].

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 [8]."

In a national [9] and then later multinational [10] 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 [11]." Since some benefit has been found from chiropractic treatment of non-musculoskeletal complaints with

related low risk, a systematic review [11] 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 [11]."

The following two cases illustrate how sacro occipital technique and chiropractic care looking beyond just a musculoskeletal component may play an effective part in patient healthcare delivery and could expand the view of how chiropractic may fit within preventative health strategies.

Case History #1:

A 13 year old female complaining of a headache (right temporal bone region) with symptoms resembling a sinus type headache.

Methods/Intervention: Inspection of the cervical spine showed spasm of grade 3+ (on a scale of 0 to 4+, with 0-1+ considered normal) of right cervical paraspinal and sternocleidomastoid muscles. Further analysis noted a spasm of the 2nd trapezius fiber [12,13] [figure 1] on the right. The muscles had a chemical tone (diffuse, spongy, and swollen). Upon palpation of the 2nd cervical vertebra, as well as the 3rd, 11th and 12th thoracic vertebrae, none of them showed the same level of tension quality as the cervical musculature. A tooth/meridian chart was reviewed [figure 2] and found that the patient's presenting symptoms could be correlated to her right upper canine tooth.

Trapezius Line Fiber	1	2	3	4	5	6	7
Thoracic Vertebra	1,2,10	3,11,12	4,5	6	7	8	9
Lumbar Vertebra			1	2	3	4	5

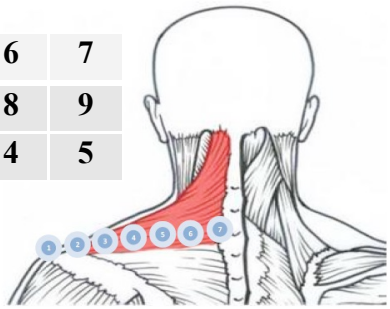


Figure 1. Trapezius fiber palpation and vertebra reflex chart.

Results: Based on the assessment the patient was referred to her dentist to evaluate whether there was any possible dental component to her presenting symptomatology. The dentist found her right upper canine tooth was infected beneath the root and she was in need of a root canal. Following the root canal intervention her temporal bone and sinus related headache resolved.

Case History #2:

Following the birth of her first child, the patient's complaint was of low back pain and pain in the right lower quadrant of her abdomen. She also complained of upper thoracic pain and constant sore shoulders. During the history it was revealed that her child during pregnancy

and labor lodged herself into the woman's right hip. An ultrasound revealed that this was likely a protective mechanism by the fetus due to umbilical cord positioning.

Methods/Intervention: Analysis revealed a pelvic torsion with sacroiliac joint hypermobility syndrome (sacro occipital technique's category 2) [13-16] with significant rotation malposition of the 5th lumbar vertebra. Occipital fiber 7, line 2 was swollen, inflamed, and sensitive to palpation [17,18]. [Figure 3] L5 malposition and reactivity to palpation was consistent with the occipital fiber, and other reflex and referred pain indicators suggested a possible viscerosomatic/somatovisceral reflex component related to a uterine issue.

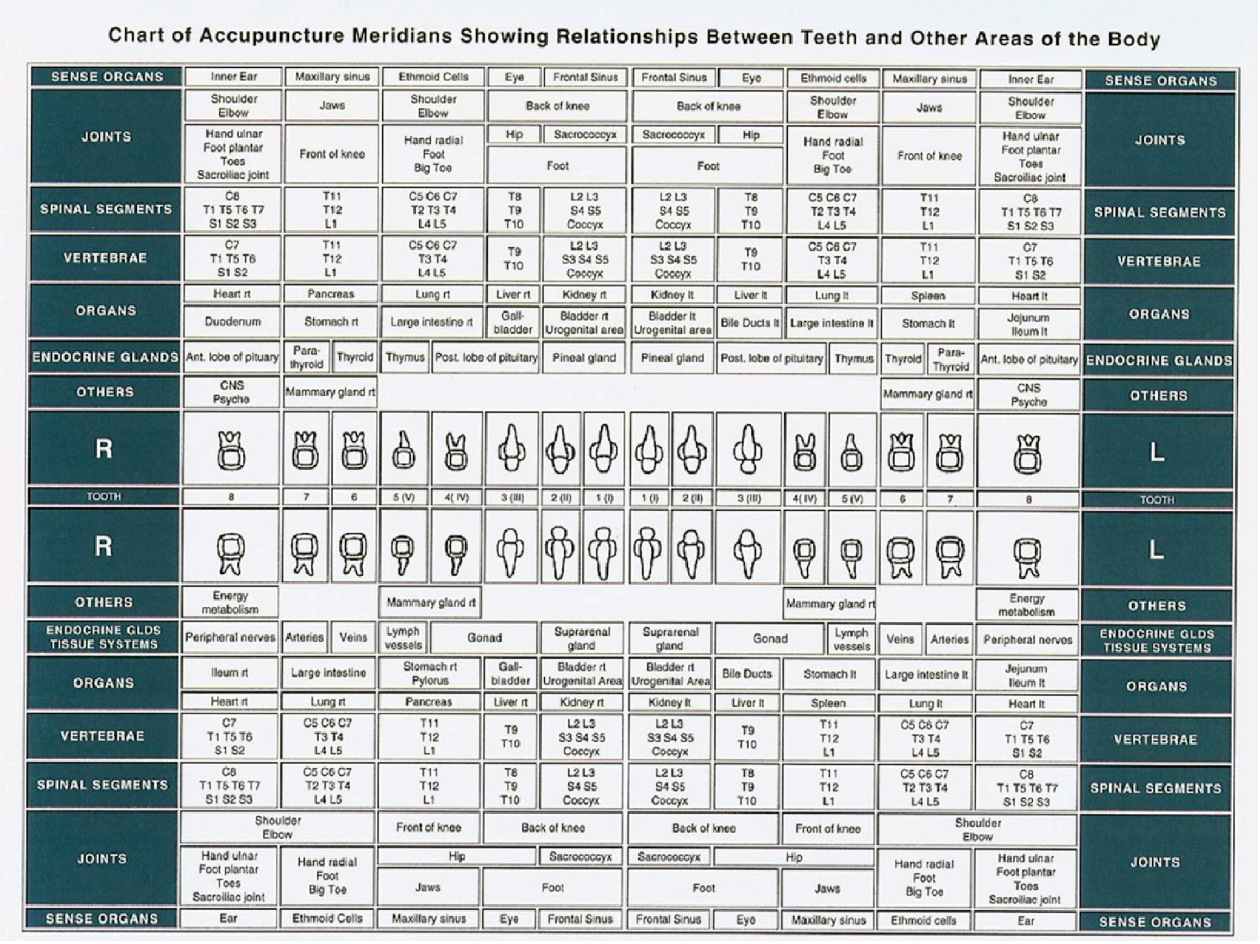
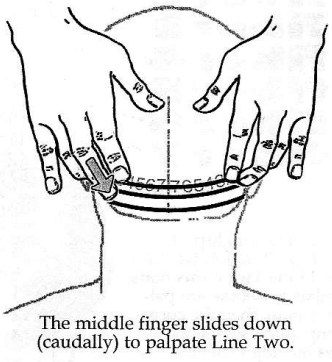


Figure 2. Acupuncture meridian, teeth, and related body areas.

Upon palpation the uterus presented as rotated, consistent with the rotation of the pelvis in the category 2 distortion. Overhead arm stretch demonstrated right psoas contraction, based on reduced arm and ipsilateral rib cage lifting on arm traction. DeJarnette developed a method of assessing iliopsoas and/or quadratus lumborum tension, which involves testing a patient's pelvic costal flexibility with an overhead arm stretch [13]. With this patient she noted discomfort pinpointing to a region lateral to the right side of the spine at the level of L4/L5 and consistent with patient's complaint of pain in her right lower quadrant.



Occipital Line 2 Fiber	1	2	3	4	5	6	7
Thoracic Vertebra	1,2,10	3,11,12	4,5	6	7	8	9
Lumbar Vertebra			1	2	3	4	5
Sacral Segments			1	2	3	4	5

Figure 3. Occipital fiber palpation and vertebra reflex chart.

Treatment began with the patient prone and occipital fiber 7 was manipulated while L5 transverse process was held until both the fiber and the TP relaxed. Then a block was placed under the left hip and traction between L4 and S1 was applied to aid reducing the L5 rotation into a more function L4-L5-S1 juxtaposition [13,19]. The patient was turned supine and pelvic blocks were utilized to reduce her pelvic torsion and reduce her sacroiliac joint hypermobility syndrome (category 2). While on the blocks, chiropractic manipulative reflex technique (CMRT) was performed to correct her rotated uterus [20-22]. Once palpation revealed (reduced sensitivity and balanced tension) improved uterus positioning, the psoas was addressed by gentle, yet firm pressure over the right lower quadrant, where over the head arm traction pinpointed discomfort. As pressure was held over the psoas, the patient began to cry, stating that the touch was causing her body to experience what felt like the same pains she experienced during the birth process. As the psoas began to release, her breathing pattern changed to become more relaxed and as that happened her psoas completely relaxed altogether.

Results; After treatment, the patient reported that she felt as though the one contact over the psoas helped her body to release all of the emotional trauma she had held from her first childbirth. Following treatment all prior indicators cleared and the patient was functioned without any limitations and reported significant improvement in her quality of life.

Discussion:

These case reports exemplify three specific factors that will need to be considered as healthcare evolves in the United States. These factors include the need for chiropractic care: (1) to have involvement in allied healthcare cross referral system, (2) to view the patient in a holistic paradigm beyond just musculoskeletal or spinal vertebra imbalance, and (3) that the chiropractor as an educator has an obligation to include the patient in the therapeutic arena.

Reviews of various surveys are finding that chiropractors can play a role in complementary alternative medicine (CAM), integrative medicine [23], and preventative healthcare. For instance when training in addition to that in chiropractic college was reported, chiropractors reported training that more closely approximated primary care medical doctors. Even though, the findings indicate that although preventative health "training seems to be increasing in the chiropractic colleges, an apparent need exists for further emphasis on preventive care, particularly in areas most relevant to a primary care practice [24]." This increased need to incorporate preventive health training and collaboration is something patients are expecting

from their alternative and allopathic physicians [25]. It is, therefore, hopeful that Garner et al, found that chiropractic has demonstrated it "can be successfully integrated into primary healthcare teams [26]."

Rupert concluded in his study on chiropractic maintenance care that "Despite educational, philosophic, and political differences, United States chiropractors come to a consensus about the purpose and composition of maintenance care. Not withstanding the absence of scientific support, they believe that it is of value to all age groups and a variety of conditions from stress to musculoskeletal and visceral conditions. The response from this survey also suggests that the level of primary care, health promotion and prevention activities of chiropractors surpasses that of other physicians [27]."

Chiropractic has a role in the early development of holistic healing in the United States [28]. For chiropractic to become a primary healthcare provider in our current healthcare environment it will mean that chiropractic care will need to look beyond the spine and musculoskeletal system [29]. Sacro occipital technique is one chiropractic technique that offers a paradigm that incorporates preventative behaviors [7] along with integrating musculoskeletal, emotional, viscerosomatic/somatovisceral, and other whole body assessments.

Jolliot in the "Mary Anne Chance Memorial Paper" notes, "While scientific advances of last centuries garnered wide support for their underlying materialistic and reductionist approach, the ancient assumption that the whole is more, or different, than the sum of its parts is still meaningful. Considerations on holism in health care take into account importance of cultural backgrounds; lifestyles and societal circumstances; complexity of individuals' attitudes and roles; current interpretations of the notion; and public health policies. Chiropractic and its principles that associate several domains of reflexion have characteristics of holism in the definition of the person and as a method of health care. This is now interpreted as the biopsychosocial model [30]."

The doctor as an educator is an important aspect of holistic and preventative care helping to involve patients in healthcare decisions [31,32]. This education helps empower a patient in their own health with the goal of facilitating their involvement in preventative behaviors. Elwyn, et al, described 8 important skill sets for doctors attempting to involve patients in healthcare decisions. "A sequence of skills was proposed as follows: 1) implicit or explicit involvement of patients in the decision-making process; 2) explore ideas, fears, and expectations of the problem and possible treatments; 3) portrayal of equipoise and options; 4) identify preferred data format and provide tailor-made information; 5) checking process: understanding of information and reactions (e.g. ideas, fears, and expectations of possible options); 6) acceptance of process and decision making role preference; 7) make, discuss or defer decisions; 8) arrange follow-up [33]."

Conclusion:

Since the 1800s the study of human anatomy, physiology, and healthcare has been split apart into different aspects, often with each aspect treated as separate and distinct parts. We have doctors for our physical bodies, psychiatrists for our emotional and mental aspects, and clergy for our spiritual selves. As a result of our own separation, on some levels we've grown separate from ourselves and often disempowered in our own health care. As chiropractors, we are in a position of utilizing our unique methods of analysis and care to be an active player in

preventative care within an allied system of healthcare. The hopes are that we can help our patients reconnect the pieces of themselves - physically, mentally and emotionally – as both a doctor and educator, which will help them to feel more empowered in their own health care and management and as a result, live healthier, more informed lives. As practitioners, it is our obligation to understand our patients at every level, in order that we can provide them the most personalized and appropriate care possible, whether that entails treatment, proper referral, or co-treatment.

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Is it Mental or is it Dental? Cranial & Dental Impacts on Total Health: A Commentary.
Raymond Silkman, DDS

Introduction

The widely held model of orthodontics, which considers developmental problems in the jaws and head to be genetic in origin, never made sense to me. Since they are wedded to the genetic model, orthodontists dealing with crowded teeth end up treating the condition with tooth extraction in a majority of the cases. Even though I did not resort to pulling teeth in my practice, and I was using appliances to widen the jaws and getting the craniums to look as they should, I still could not come up with the answer as to why my patients looked the way they did. I couldn't believe that the Creator had given them a terrible blueprint --it just did not make sense. In four years of college education, four years of dental school education and almost three years of post-graduate orthodontic training, students never hear a mention of Dr. Price, so they never learn the true reasons for these malformations. I have had the opportunity to work with a lot of very knowledgeable doctors in various fields of allopathic and alternative healthcare who still do not know about Dr. Price and his critical findings.

These knowledgeable doctors have not stared in awe at the beautiful facial development that Price captured in the photographs he took of primitive peoples throughout the globe and in so doing was able to answer this most important question: What do humans look like in health? And how have humans been able to carry on throughout history and populate such varied geographical and physical environments on the earth without our modern machines and tools?

The answer that Dr. Price was able to illuminate came through his photographs of beautiful, healthy human beings with magnificent physical form and mental development, living in harmony with their environments.

What Is Happening?

It has been well documented and Nobel prizes have been awarded to researchers that have established the relationship between proper form and development and proper physical functioning of the body. The changes in facial structure that we observe in our children today are an extremely serious matter. I would like to explore the consequences of what is happening to human physical form.

Let's evaluate what happens to our children or adults who have faces that are narrow and long, who have lower jaws that are not developed properly, or who have a profile view showing a very weak chin. What happens when we see jaws so narrow and small that the teeth are crowded and overlapping? What happens when the cranium is underdeveloped in various dimensions and the eyes are not level with one another?

What is the physical health legacy of these individuals going to be? What happens when we see children and adults with forward head posture--necks that are holding the head in a forward position?

There's an old saying, that someone "has his head on his shoulders." The translation: well-grounded minds require well-grounded and well-supported physical forms and bodies.

Unfortunately today a lot of people don't have their heads on their shoulders--their heads are positioned in front of the shoulders.

Since a normal adult cranium weights between 12 to 18 pounds, the musculoskeletal strain in the neck or cervical region to support a forward head posture can cause a cascade of events leading right down to the feet. The forward head posture in most individuals creates improper spinal alignment and lack of proper curvature to the spine at critical areas.

There is also an alarming trend in hip and knee replacement surgeries and many individuals have improper or mostly flat arches in the feet necessitating orthotics in their shoes or, even worse, corrective surgeries.

What happens to people when they don't have their heads on their shoulders? What is causing this effect and why does the body support this apparently futile posture? We will answer that question.

The Cranium or Skull

Let's discuss the significance of the skeletal structures in the head. The human cranium is made up of roughly 22 cranial bones not including the ones responsible for sound transmission. One of the key bony structures in the cranium is the maxilla, or the upper jaw. The cranium also houses the extremely important glands of the endocrine system. Two of these glands, the pituitary and the hypothalamus, are housed in another very important bony structure known as the sphenoid bone residing directly and in close contact with the maxilla.

The entire brain, and all of the structures or glands housed in the cranial cavity as well as the spinal cord and all of the peripheral and accessory nerves in the entire body are covered by a continuous-membranous sheath called the dural membrane. In dissections, it has been demonstrated and documented that pressure or force on the dural membrane in the cranial cavity or at the brain level will create pulsation or an opposite force at the end of the spinal cord, and vice versa.

If the cranium is not developed properly, the dural membrane can become twisted and torqued, thus possibly creating nerve conduction issues, hormonal imbalances or pain. You can imagine the effects that this can have on the nervous system and on an individual's overall health and well being.

Interestingly, medical research has demonstrated the presence of constant and rhythmic movement of the cranial bones at the contact areas, also known as the sutures. Just as in breathing, when the lungs fill with air and then empty, so there is a movement of cerebral spinal fluid up and down the spinal cord and around the brain. So, unlike the popular belief that "it's good to have a solid noggen," we now know that this does not mean an immovable head or cranium. The inherent motion in the cranial bones is very important to over all health. Various accidents or trauma or surgical interventions of the face and head can have a negative effect on this motion.

There are also various foramina or openings in the bones of the skull which allow nerves and blood or lymphatic vessels to pass from the cranium to the lower areas and vice versa. If any of the cranial bones is under-developed or misshapen, as often happens to be the case, then these foramina can also be malformed.

For example, they may be ovoid rather than circular because of underdevelopment, which may cause an impedance to flow of circulatory or neurological vessels going through that particular foramen. Improper drainage of our waste products through our lymphatic system or lack of oxygenation or nourishment of cranial tissues and organs may be experienced as negative effects on brain function and mental clarity.

The Maxilla

This bony structure provides visible structure to the whole mid-facial area. Eleven of the cranial bones directly contact the maxilla and the rest of the cranial bones have an intimate contact with the bones directly in contact with the upper jaw or maxilla. Therefore the position and size of the upper jaw has quite a lot to do with proper cranial development and facial aesthetics.

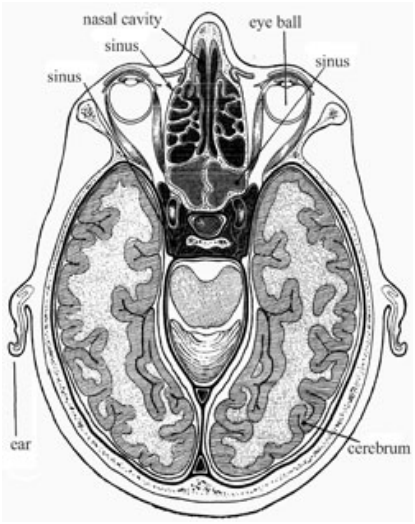
The entire floor of the orbit or eye sockets, where the visual globes or the eyeballs are housed, is made up of the upper jaw or maxilla. When the maxilla is not well developed, and the face is long and skinny, the eye sockets do not develop properly; the eyeballs cannot develop as a sphere, but may take on a football shape. The resultant developmental pattern can create various ophthalmic issues such as astigmatism or myopia. We can treat astigmatism with corrective lenses but the treatment does not really address the root of the issues.

Airway Obstruction

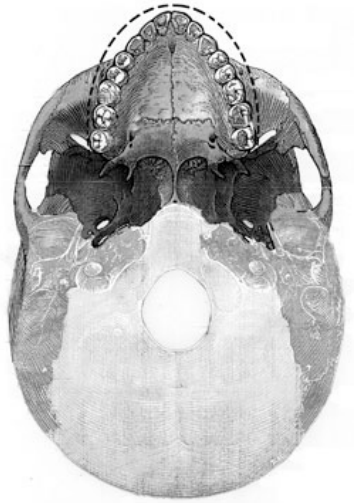
The most serious consequence of under development of the maxilla is airway obstruction and mouth breathing. Eighty five percent of the nasal airway is made up of the maxilla, which provides the floor of the nasal cavity and houses all of the nasal sinuses typically referred to as the sinus cavities. Therefore, an individual with a narrow or improperly formed maxilla will have extremely narrow nasal passages, which limit flow of air and breathing capabilities, and will thus experience difficulty in having proper sinus health and drainage.

It is an important fact that the soft tissues develop to their genetic size, even when the bones do not! You might think of the head as a box that must house all of the structures that the genetic code needs to express and that will develop, but lack of proper dimensions to the cranial bones and the cranial cavity causes overcrowding, overlapping or deviation of some soft tissue areas. This can be illustrated by the example of over packing a suitcase.

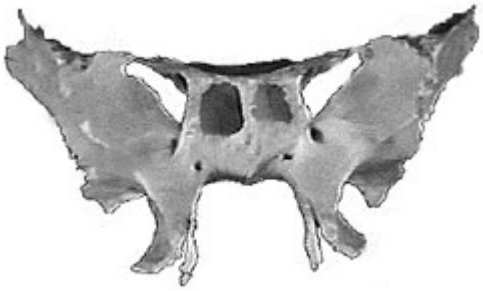
An example of this "over packed suitcase" in humans occurs in the nose. How often have you heard someone say, "I have a deviated septum"? The septum is the cartilaginous tissue membrane that separates the two nostrils vertically. Imagine this soft tissue developing to its normal size, but the maxilla remains underdeveloped. The developing septum has to express its dimension somewhere, so it has two choices—it either deviates or bends to one side or the other (the deviated septum) or it grows through the maxillary suture and creates the condition known as palatal tori. These are bumps or ridges in the middle of the palate and most people have them to some degree or another.



View of the interior of the head. Note the small area in the center where the nerves and blood vessels must pass.

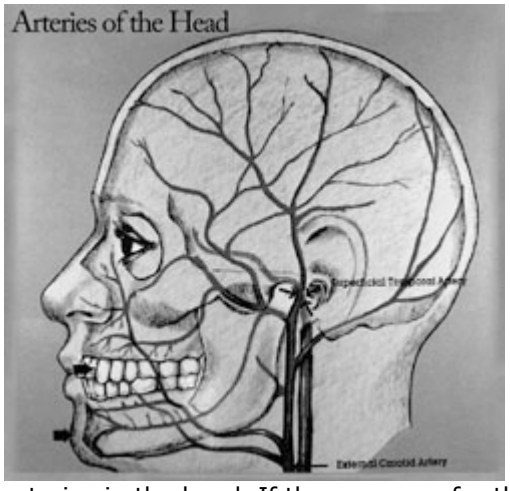


The maxilla viewed from underneath. Note the narrow palate in this illustration.



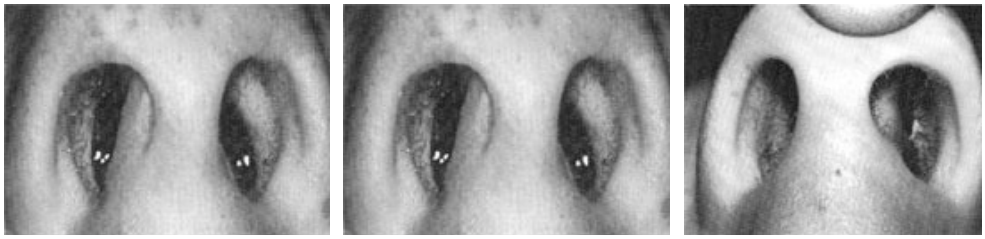
The complex sphenoid bone, positioned behind and above the maxilla.

Side view of the head showing the tongue and the nasal cavity



The arteries in the head. If the passages for these arteries run through skeletal openings that are too narrow, many detrimental effects can occur.

A deviated septum blocks proper nasal air flow causing the individual to take up mouth breathing most of the time. There are a variety of other soft and hard tissue conditions associated with the nasal cavity such as polyps, enlarged turbinates and muscosal conditions that also serve to restrict air flow.



A deviated septum or overgrowth of the soft tissue in the nose can cause blockage of the nostrils, leading to mouth breathing.

Breathing through the nose creates an avenue of air that's moisturized, humidified and even somewhat filtered. Furthermore, when we breathe through our nose, the air passing through the nasal airway and contacting the turbinates--shelf- like bony structures--is slowed down. This allows the proper mixing of the air with an amazing gas produced in the nasal sinuses called nitric oxide (NO). Nitric oxide is secreted into the nasal passages and is inhaled through the nose. It is a potent vaso-dilator, and in the lungs it enhances the uptake of oxygen. NO is also produced in the walls of blood vessels and is critical to all organs.

Mouth-Breathing

Let's evaluate the differences in mouth breathers and nose breathers. The consequences of mouth breathing can occur from the moment of birth because all infants are obligate nose breathers. That is the mechanism by which breast feeding and breathing can occur simultaneously. If a baby has obstructed airways, he may turn away from the breast due to lack of air and prefer a bottle, which allows him to consume his food more quickly.

A mouth breather will not be humidifying the air, or slowing it down to allow the proper mixing of NO with it. The lungs will have difficulty providing maximum oxygenation for the body with this dry, unhumidified, unfiltered and, most importantly, NO-lacking air. This constant and chronic condition affects the cardiovascular system and the heart because the smooth muscles that line all of the arteries react to this poorly oxygenated air with a kind of tightness, a kind of permanent tension, which can be very stressful and depleting to the body. Furthermore it has been clinically shown that blocking NO production in healthy individuals results in moderate hypertension and reduced heart output as well as shortened bleeding times by activation of platelet blood-clotting factors.

Due to the lack of proper oxygenation, the ability to deliver fully oxygenated blood to the cells is also much reduced. Thus mouth breathing has a negative effect on every cell in the body as it deprives them of oxygen. Overall wellness and health requires proper oxygen as every particle of our being requires oxygen. Cancer cells, by the way, are anaerobic by design. Other manifestations of mouth breathing include snoring and cessation of breathing (also known as sleep apnea), some types of headaches, hypertension without other known clinical causes, bed wetting, chronic ear or sinus infections, TMJ pain, sleep disorders and dark patches under the eyes.

Visual Diagnosis

Much valuable information can be obtained by looking at and studying the faces of traditional peoples with proper physical development and form. I am deeply grateful to Dr. Price and all of the photographers and cinematographers who have provided us with such valuable clues and information.

We can tell a lot about an individual's physical development just by looking at the face. One of the things I look at in profile view is the nasal-labial angle. In a well developed person, this angle is an acute angle, that is, less than 90 degrees. A nasal-labial angle that is obtuse, that is greater than 90 degrees, is a sign that the maxilla is not well developed or positioned in the front-to-back dimension of the skull. The proper development of the maxilla is absolutely critical to the formation of the entire head and to the health of the entire body—and not just physical health but spiritual and emotional health as well.

In the photograph at left we see an individual with a nasal-labial angle of about 110 degrees, a sure sign that the maxilla is underdeveloped. As a consequence, he will not have an optimal development of the rest of head. Predictably, he has a narrow palate and in this case, he has had four premolar teeth extracted.

Another sign of poor facial development can be detected in the eyes. When someone is looking straight at you and you can see the sclera or white of the eye ... that is a tip off to a very, very under developed upper jaw and mid-facial area.

Another area of interest is the soft tissues and skin. Sagging and wrinkles are minimal or non-existent in people with good physical development as they age. Their faces don't sink back into their craniums. Wrinkles happen when the scaffolding—the bony structure—becomes diminished in comparison to the muscles and skin.

As I mentioned, the soft tissues of the body grow to their genetic size, even when the bony structures do not. The skin, the tongue, the tonsils and the nasal tissues grow to their genetic size but when the nutrition is missing, the bony structures are compromised. So the face will have an excess of skin and musculature, the tongue and tonsils will be too large for the mouth. Nasal bumps can also result--the nasal tissues are out of proportion to the facial structure so they protrude. People who have proper facial development do not have nasal bumps.

The TMJ and the Lower Jaw

When we look at the skull from the profile view we observe the temporomandibular joint, the TMJ. Most joints will go through normal hinge motion, and some of them like the shoulder and hip joint will have a rotational motion that is more complex. However, in these joints, the two bony members stay in contact with one another throughout the motion of the joint. The TMJ is unique in that it is designed to provide both hinging and sliding motion. In order to accomplish this compound hinge-and-sliding movement, the TMJ has a disc that slides in concert with the lower jaw or mandible. When the lower jaw is not positioned forward enough, the TM Joints do not develop very well, and the discs can get jammed behind or in front of the joint. They can even become perforated and cause some of the "clicks and pops"

that can be heard when people open and close their mouths. Immediately behind the TM Joints we also have the ear canals and important vascular and neurological structures, which can become impinged upon as well.

What we call an overbite or overjet should really be called an underbite, because it is caused by the mandible, the lower jaw, which is too far back, not the maxilla that is too far forward. But when children come to the orthodontist with what the public calls an overbite, they are often treated by removing some of the teeth in the upper jaw and then with a device known as neck gear or headgear to pull the maxilla back. The thinking is that the apparatus will stunt the growth of the maxilla and allow the lower jaw to grow and catch up, or that the maxilla has grown too far forward and must be pulled back.

But the maxilla is already stunted due to poor nutrition and so you can imagine how this type of treatment may cause more compression, more jamming of the bones in the head with possible detrimental whole body effects. The correct treatment for this condition is to widen the palate with an appliance so the lower jaw position can be corrected forward and allow proper physiological form and function as our ancestors have enjoyed throughout the millennia.

More Visual Clues

When children or adults are not breathing properly they tend to develop dark patches and bags under their eyes. This is due to lack of adequate circulation as well as venous blood pooling in these areas.

Kids that are mouth breathers will always have chapped lips and typically the line separating the inner lining of the lip and the outside lining, known as the vermilion border, will be visible. Also mouth breathers in profile tend to have very weak chins and elongated faces. Typically these individuals will suffer from chronic sinusitis or sinus infections, colds, respiratory problems and lung-related issues.

Typically children with bags under their eyes have short attention spans because they do not have good circulation and oxygenation of the head and can tire easily. They are literally suffocating.

Furthermore, they don’t sleep very well--they are always tossing and turning and they wake up tired. Your body recuperates during sleep and sleep is especially important for teenagers. Teenagers need to go to bed before 10:00 pm because certain brain cycles designed for recuperation of the body kick in at around that time. These cycles will be interrupted if sleep mode is delayed to after 10:30-11:00 pm. The recuperation and rebuilding necessary to cope with stressful daily activities will then be compromised. These are the tired, sleepless kids who tend to have a diet high in sugar, trans fats and grains. They may end up labeled as ADD or ADHD and treated with drugs.

Airway capacity is the biggest and most important part of the well-being of a human being. It is important to stress the fact that breathing through the mouth and breathing through the nose have extremely disparate effects on the body. We are not designed to breathe through our mouths. The body is able to live by breathing through the mouth, but it suffers greatly for doing it.

Internal Structures

The structures that hang off the mandible or lower jaw include the tongue and the nasal pharyngeal areas, which eventually lead down into the lungs.

Other structures that can affect the airways further back in the throat area or the pharyngeal airway space are the tonsils and adenoids. About 85 percent of the children I see in my practice have extremely large tonsils and do you think they can breathe very well? It is not possible to breathe very well when tonsils, which are typically supposed to be almost unnoticeable, are so inflamed that they are almost touching and practically closing off the airway in the back of the throat, right where air is supposed to pass on its journey towards the lungs.

Examples of Poor Facial Development

Narrow face, mouth breathing, and sclera showing under the eyes.

Over bite or over jet, dark areas under the eyes, and weak chin.

Narrow face, circles under eyes, nose bump, and tendency for face to sag.

These structures also become swollen due to food allergies, especially allergies to pasteurized dairy. Every time I've had a kid and a mom convinced that they should stop everything pasteurized and processed and then eventually go to raw dairy products I have seen some reduction in tonsillar size, although this doesn't happen overnight.

(Interestingly, I have had two cases of children who stopped having epileptic seizures as soon as they had their extremely massive tonsils taken out. Please note that I usually do not recommend removal of organs and body parts.)

Almost invariably a narrow or under-developed maxilla can cause the effect of holding back the lower jaw or the mandible. This improper positioning of the mandible and its inherent retrusion causes a lack of physical and physiological space for the tongue and the pharyngeal tissues, which again will provide an impedance to the airways, causing breathing difficulties and lowered oxygen uptake by all of the tissues.

The most important orthodontic appliance that you all have and carry with you twenty-four hours a day is your tongue. People who breathe through their nose also normally have a tongue that postures up into the maxilla. When the tongue sits right up behind the front teeth, it is maintaining the shape of the maxilla every time you swallow. Every time the proper tongue swallow motion takes place it spreads up against maxilla, activating it and contributing to that little cranial motion, that cranial pumping that we discussed earlier. Individuals who breathe through their mouths have a lower tongue posture and the maxilla does not receive the stimulation from the tongue that it should.

When the tongue doesn't fit inside the jaws or dental arches it retracts back into the throat and pushes on the floor of the mouth. The result is something that looks like a double chin, even in women who are very thin. When we begin palate-widening procedures, this problem disappears--without plastic surgery.

And then what happens when orthodontists treat these problems by removing teeth? If he takes out eight teeth out of a total of 32 (four first molars and then later on four wisdom teeth), the patient ends up missing one-fourth of his teeth. What are the consequences of this? Can you take out 25 percent of anything that's supposed to be whole and expect it to be okay? I consider the teeth as organs and do not recommend the removal of teeth for tooth crowding or orthodontic treatments.

And what happens when a child is given head gear or neck gear, when you put a force on a cranium to pull it back? There can be serious consequences.


Types of headgear used to pull back the upper or lower jaw

The Final Answer: Adaptive Capacity

Our bodies have an adaptive capacity to deal with shortcomings. Those of you who have studied CPR know about the ABCs of resuscitation. The A stands for airways and what are you supposed to do when someone needs assistance? You tilt the head back to open the airway. Similarly, when the airways are chronically blocked, the body tilts the head back. But humans cannot walk around with their noses up in the air for too long. The eyes must be parallel with the horizon, so the body then leans the head forward. Forward head posture in essence is a chin lift procedure with the eyes corrected to the horizon in a vertical or standing position.

That's where that characteristic forward head posture comes from. This chin-lift, head-tilt-forward posture helps open up the airways. As I mentioned, craniums on adults weigh 12-18 pounds. Imagine a bowling ball.

If I carry the bowling ball close to my body, I can carry it without becoming tired, but if I carry the bowling ball out in front of my body, what happens? I am going to suffer from fatigue. So then, in order to balance the head tilted forward, I may extend my butt out a bit, which creates a misalignment of the hips, but helps to balance the extra forward weight of the ball. How many people do you know that have hip and lower back problems? Most of those people also have airway problems. Also, there are limbs attached to the hips--we call them legs--so when the hips go out of alignment, the knees have to adjust to this weird hip posture.

These adjustments are all very subtle. One doesn't wake up and feel that he or she is going to walk differently. Can you imagine that all of these issues and events can start with a baby who is chronically breathing through its mouth? So airway capacity is the most important

hallmark of the well-being of a human being. If you have good airway capacity, you will go through life with a strong immunity to illness.

Breathing difficulties can lead to the tiring head tilt forward position.

Sympathetic Overload

When the bones in the head are underdeveloped or misaligned, the soft tissues are over-crowded and unable to assume their normal shapes and positions and the air way is obstructed. When, in addition, the diet is not nourishing and lacks proper fats, the nervous system also suffers.

Let me explain: as you may know, there are two types of autonomic nerves, sympathetic and parasympathetic. The parasympathetic nervous system works to calm us down and to heal. The sympathetic nervous system is the part used when one needs to get out of a dangerous situation. It operates when we are under a lot of stress, and we are not meant to be under constant physical stress. When the sympathetic nervous system is activated it places the body and mind in an alert mode and this mode and the constant stress depletes the bodily reserves and nutrients.

Sympathetic nervous system overload also occurs when the airway is obstructed and the input or sense to the nervous system is akin to a hand or choker around the neck. What type of response do you think the nervous system will have? It's on high alert at all times. This is why kids who are mouth breathers have a strong gag reflex, for example. For them, the mouth is the source of air as well as the source of food, and the mouth was not designed to perform both of these functions. So kids and adults who are mouth breathers have strong gag reflexes, sometimes so strong that they can't get near their mouths without difficulty, not even with their own toothbrushes or eating utensils. This, of course, precludes certain psychological issues that can also create a strong gag reflex but can be ruled out during an assessment.

So mouth breathers tend to have amped-up sympathetic nervous systems, always on alert, and they have a hard time getting their physical or mental bodies to relax. Many have found an avenue of dealing with this issue subconsciously, namely exercise and physical exertion. This is because during physical exertion large volumes of air are inhaled, which may give the body the input it needs to make up for the lack of proper oxygenation during rest periods.

Long-Term Consequences

People who are not well oxygenated and who have poor posture often suffer from fatigue and fibromyalgia symptoms, they snore and have sleep apnea, they have sinusitis and frequent ear infections. Life becomes psychologically and physically challenging for them and they end up with long-term dependence on medications—and all of that just from the seemingly simple condition of crowded teeth.

In other words, people with poor facial development are not going to live very happily. They're always going to be in and out of treatment, hopefully with a more holistic alternative practitioner—but you can take all the herbs in the world, you can take all the homeopathic medicines for these conditions, but the truth is, you cannot have proper function without the proper structure. If you don't have the proper form how do you expect proper function even with the best alternative care?

So, as you can see, airway capacity is extremely important and many times when we do the procedures that widen the palate, correct the head tilt and allow a person to breath through the nose, that person suddenly becomes happy. It is amazing to see the things that happen when we take steps to expand the palate and the upper jaw. The patients go through a literal expansion, but they also open up in many ways-- they open up their hearts and their personalities and relationships change. They become more pleasant, more contented. A lot of amazing things can come about just from changing the shape of the maxilla for a human being.

Well-Formed and Hardy

My friends think I am nuts but I can stare for hours at photographs of well-formed individuals and just marvel at the beauty of proper physical form and function and the capabilities for hard work and functioning that these individuals tend to have.

Examples of excellent facial development: Note the broad middle portion of the face, well-developed lower jar and smoothness (lack of sags or circles) under the eyes. These individual illustrate the full expression of our genetic blueprint.

Let's ask a question: who can perform better in jobs or sports with very difficult physical requirements and conditions? Generally you will find the well-developed (that doesn't mean large muscle mass), well-formed individuals who are capable of such physical feats and they tend to come from rural or isolated areas or from families that have consumed more traditional diets and therefore had much better development than the average city child growing up these days. Many of these individuals are people who come from other parts of the world and are involved with professional sports and or jobs we consider menial, such as doing our gardening, housework and construction work, and even raising our children--people who are able bodied and capable.

Therefore if we are looking for the magic period to help a child grow into an individual with amazing physical capabilities then we must acknowledge that the most important developmental period is preconception and the nine months in utero or in the womb--this is when the foundation is laid for living a full 120 years. The parents should prepare themselves well in advance of conception by eating a nutritionally supportive diet, based on the principles discovered by Weston Price, and continue that diet during pregnancy. If, through

out the individual's life, such nutritional practices are continued, then the possibility to have excellent physical form and function is highly likely, with great rewards to that individual. Please take into consideration the fact that over the last 100 to 120 years in this country, many events and conditions have slowly weakened the offspring born in each successive generation. Modern medicine classifies some of the physical symptoms encountered in the younger generations as genetic; however, even though there may be genetic aberrations occurring due to toxicity of the environment, these symptoms are a reflection of the improper human development due to poor nutrition.

The people who were born in the 1920s, '30s and '40s tended to drink and smoke. They had teeth extracted, root canals and metal fillings, yet they are generally not the chemically sensitive individuals we see in our population today, young people in their twenties who can't handle even a little bit of lavender scent in the room.

Sources of Energy

We must also briefly discuss other sources of input or energy besides diet needed to create proper physical form and mental function. There is a concept that views a human being as a sort of battery or capacitor. We are the sum of all that goes into us, not only our physical diet but also the input of an emotional or spiritual nature, including our connections to one another, to nature and animals, to art, to the Creator and also, most importantly, to ourselves.

A connection that more than 90 percent of individuals lack is the connection to the earth. Historically, humans have had some form of physical contact with the earth and its electro-magnetic field. We worked on the land and collected our sustenance with our feet or bodies in contact with the earth and without the interference of man-made materials and building structures. So it's important to literally stay connected with the earth by walking barefoot outside and letting all of our senses recalibrate themselves to what our body knows as normal.

Finally, we get energy from our belief systems and from our beliefs about ourselves. When something goes wrong, do we berate ourselves or do we see our troubles as important lessons given to us because we are worthy to receive them?

Humans Recognize Proper Facial Form

While very few people have heard of the work of Weston Price these days, we haven't lost our ability to recognize proper facial form. To make it in today's society, you must have good facial development. You're not going to see a general or a president with a weak chin, you're not going to see coaches with weak chins, and you're not going to see a lot of well-to-do personalities in the media with underdeveloped faces and chins. You don't see athletes and newscasters with narrow palates and crooked teeth.

Unfortunately the trends in cosmetic facial and body enhancement procedures make one believe that all can be bought with money and surgery, but a word of caution: avoid implantation of objects or removal of organs as they interfere with normal and natural processes of the body, mind and soul. Great research has demonstrated that cells communicate with one another via a form of light and surgery tends to disrupt these light pathways, also called meridians or chi pathways.

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Sacro Occipital Technique: Palpating Occipital Fibers on Animals – A Pilot Study.
Jean E. Thompson, DC, Heidi Bockhold, DC, Charles L. Blum DC,

Introduction

Sacro occipital technique (SOT) has developed various pre- and post- treatment assessment tools. [1] One assessment tool developed by the technique's developer, Major Bertrand DeJarnette, is called occipital fiber analysis and treatment (OFT)[2]. This SOT assessment tool is used to analyze and treat thoracic, lumbar, and sacral segments. The rational for using OFT is to find regions of the body that have interrelationships through direct musculoskeletal and/or indirect reflex to the occipital region, spinal segments, and possibly to visceral referred pain pathways. According to SOT protocols, visceral referred pain pathways, both viscerosomatic and somatovisceral, are assessed with OFT to help determine which vertebral level should receive chiropractic manipulative reflex technique (CMRT).[3]

CMRT, originally called Bloodless Surgery, was a method taught by DeJarnette since 1939[4]. Developed over the years, until modified to utilize occipital fibers whereupon he renamed the methodology chiropractic manipulative reflex technique (CMRT)[5]. CMRT is used as a method of treating the spine and vertebral visceral syndromes associated with viscerosomatic or somatovisceral reflexes[6-8], dysafferentation at the spinal joint complex[9], and visceral mimicry type somatic relationships[10].

Treatment involves location and analysis of an affected vertebra in a reflex arc by way of occipital fiber muscular palpation, similar to trigger point analysis or Dvorak and Dvorak's spondylogenic reflex syndromes.[11] Once specific vertebra reflex arcs are located, corroborated with referred pain pathways, and clinical symptomatology, then the specific vertebra to be treated is isolated by pain provocation, muscle tension, and vasomotor symptomatology. Often times if a vertebral dysfunction is chronic or unresponsive to chiropractic spinal manipulation then a viscerosomatic or somatovisceral component is evaluated.[12]

CMRT involves using OFT to assess vertebra involvement. Reflex viscerosomatic regions are assessed along with patient history and sometimes laboratory analysis to determine the primary organ or system involved. Then using CMRT protocols the patient is treated (with) for chronic vertebral imbalance secondary to visceral disorders or viscerosomatic dysfunctions, using chiropractic manipulative procedures, soft tissue reflex techniques, visceral manipulation, and dietary or nutritional modifications, as indicated.[3]

While CMRT protocols need more reliability and validity study, the palpation for pain in humans does help its reliability since palpation for pain alone has been shown to have reliability. With animals, veterinarians and their owners purport that each species has cues to inform the practitioner whether a region or location of palpation is uncomfortable or not. The phenomena of interpreting when an animal is in pain or when a region touched is sensitive, warrants further study[13,14]. Whereas with humans, a patient clinical history guides one to a diagnosis, with animals this is dependent upon the veterinarian or owner. Laboratory tests can be used to further help hone in on where treatment needs to be focused.

CMRT is developing an evidence base of literature for the treatment of humans[15-42] and recently also for animals (canines and equines).[43-46]. The palpation of occipital fibers is in CMRT, as an assessment tool to rule out residual subclinical findings, even as symptoms

improve. As OFT [Figure 1] has not been studied previously in quadrupeds, it is unclear if the occipital fibers are based only on bipedal spinal righting reflexes.

In bipedal humans the rational for OFT rests upon visual and vestibular righting mechanisms, which occur as a method of accommodation to keep the head upright and parallel to the horizon. [47,48] Of interest is whether these reflexes could be found in quadrupeds and if these reflexes are similar to what has been found clinically in bipeds. [49,50] There does seem to be some similarity between upper cervical joint positions in bipeds and quadrupeds since, when at rest both, bipeds and quadrupeds hold the atlanto-occipital articulation and the upper cervical joints (C1/C2, C2/C3) in a flexed attitude." [51]

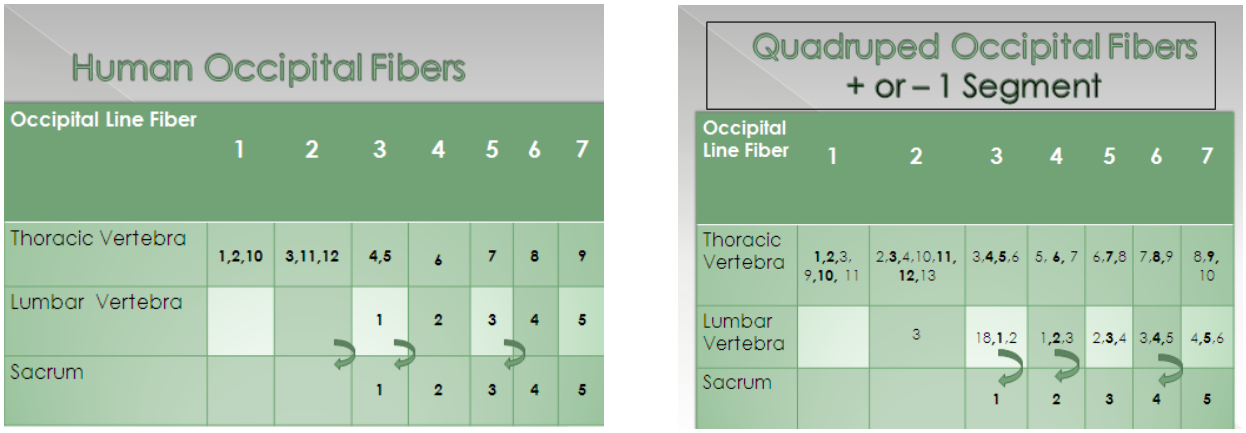

Figure 1. Proposed comparative Human and Quadruped Occipital Fiber Charts.

The purpose of this pilot study was to determine if experienced SOT doctors could palpate occipital fibers on canines and if it could be determined that certain fibers were more prominent on one side or the other.

Methods and Intervention

With cooperation from the canine's owner, who consented and was present during this study, three canine subjects were included in this study. The canines were in no distress and their body language suggested they enjoyed the experience of having the back of their heads gently palpated. Each canine was palpated by 11 experienced SOT doctors that had no knowledge of each dog. The doctor would palpate subject one, two, and three without anyone else in the room, except for the canine's owner and the doctor gathering data. During the canine palpation and data collection there was no discussion, so as not to influence the testing doctor's findings. The doctors in the study were asked to not discuss the study or what they found during palpation with anyone, while the test was underway.

Following palpation of a canine subject, the doctor was asked to complete a survey [Sample Survey Form] that asked the following questions:

1. Could you palpate occipital fibers on this animal?

2. How many occipital fibers were you able to palpate on each side of the canine's suboccipital region?

3. Of the fibers you may have palpated which one(s) were most prominent and on which side?

Results

The years of experience as chiropractors practicing SOT varied from the most at 59 years to the least at 14 years, an average total of 28 years. All doctors in this study reported that they could palpate occipital fibers on the three canines, however the number of fibers palpated was inconsistent, with the number 7 being the most common finding [6 of 11 doctors]. There was apparent confusion about whether the "# of Fibers Palpated" related to "total" number of fibers palpated on a side or the number of "active fibers palpated. This was particularly apparent with those doctors who noted "3" fibers palpated and then also noted "3" prominent fibers. There was no clear consensus regarding how many active occipital fibers were palpable and which side or fiber was most prominent. [See table 1.]

Table 1. Data: OFT Canine Palpation Study
(R=Right, L=Left, B=Both)

Doctor	Years of SOT Experience	Canine #1		
		# Fibers Palpated	Side of Prominence	Prominent Fibers
1	30+	6	Left	3L,6L
2	25	1	Left	7L
3	30	7	Both	2B,6B
4	25+	7	Both	2R,5B
5	16	5	None	None
6	19	3	Left	1L,4L,5L
7	59	7	Left	6L
8	25	3	Right	4-6R
9	14	7	Left	7L,1R
10	25	7	Left	5L
11	33	7	Both	6B

Doctor	Years of SOT Experience	Canine #2		
		# Fibers Palpated	Side of Prominence	Prominent Fibers
1	30+	6	Right	3,4,5
2	25	3	Both	2,L,6L,2R
3	30	7	Both	2r,3L,4L
4	25+	7	Right	6,4,3,2
5	16	5	Right	4R
6	19	4	Left	2-5L
7	59	7	Both	2R,4L
8	25	4	Both	4-5R,5-6L
9	14	7	Both	6-7R,2L
10	25	7	Left	4L
11	33	7	Left	6L

Doctor	Years of SOT Experience	Canine #3		
		# Fibers Palpated	Side of Prominence	Prominent Fibers
1	33	7	Left	3L
2	25	1	Right	4R
3	30	3	Both	3R,7B
4	28	7	Right	4R,2R
5	16	3	Left	2L
6	19	3	Both	2R,3B,6B
7	59	7	Right	5R
8	25	6	Both	3-6R,4-5L
9	14	7	Both	4R,3L
10	25	7	Right	6R
11	33	7	Both	5B

Discussion

It appears from this study that occipital fibers can be palpated on a canine. However there was not much consistency on how many fibers each doctor could palpate on each side or which side or fiber was most prominent. The doctors in the study did note that the question regarding how many fibers were palpated may have been confusing. This could be rectified in a future study if the question being asked is whether the question was asking for "total" fibers or "active" fibers.

Future studies may be more productive if doctors in the study have greater experience palpating occipital fibers in canines. This may be particularly important since none of the doctors in this study had previously attempted to palpate occipital fibers on a canine. Also it possible that the palpation of a canine's suboccipital myofascial region may change after palpation from doctor to doctor thus having a static occipital fiber condition may not be a reasonable expectation. Even though occipital fibers have been studied in humans[52-54], most of the research is in the preliminary stages. Therefore interexaminer reliability of occipital fiber palpation in humans (as well as in animals) will need further study.

Conclusion

This study is the first attempt to demonstrate palpable occipital fibers on a canine. While all doctors in the study determined they could palpate occipital fibers in all three canine subjects, it is unclear if the doctors had a preconceived expectation that occipital fibers would be present. Future study is needed to better address the questions asked as well as determine how to gain clearer data. Since there have been no other studies to date published on the palpation of OFT in animals, this pilot study was is an important first step.

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Sample Survey Form

SOTO-USA 2013 – Canine Occipital Fiber Study

Doctor's Name _____

Years of Experience in SOT _____

Subject #1

Can you palpate occipital fibers on this animal? Yes No

How many on each side to you note? 1 2 3 4 5 6 7 8 9 10

Of the fibers you may have noted which one(s) were most prominent and which side?

Right Left Both Sides Fiber Numbers(s) _____

Subject #2

Can you palpate occipital fibers on this animal? Yes No

How many on each side to you note? 1 2 3 4 5 6 7 8 9 10

Of the fibers you may have noted which one(s) were most prominent and which side?

Right Left Both Sides Fiber Numbers(s) _____

Subject #3

Can you palpate occipital fibers on this animal? Yes No

How many on each side to you note? 1 2 3 4 5 6 7 8 9 10

Of the fibers you may have noted which one(s) were most prominent and which side?

Right Left Both Sides Fiber Numbers(s) _____

TECHNIQUE SOT

Sacro Occipital Technique Research Updates

By Charles L. Blum, DC

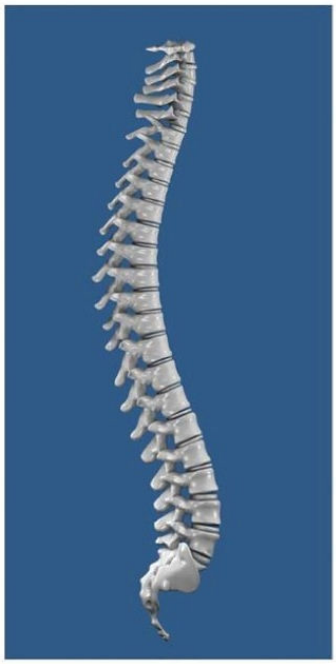
There are various forms of research, and some of the most rigorous are in the form of randomized controlled studies. In such studies, the doctor and patient are blinded to an intervention, there is a control group, and often a sham comparative intervention is used. These types of studies are very expensive and challenging to perform and are not conducive to the study of manual therapy interventions such as chiropractic. While our chiropractic academic community struggles with obtaining funds for these types of studies and figuring out the best study designs that can yield the most clinically useful information, the case report remains what doctors in clinical practice have to share findings.

Since 2009, the Sacro Occipital Technique® Organization – USA has held annual Sacro Occipital TechniqueResearch Conferences. Most of the presentations are case reports from doctors predominately in clinical practice.

Major Bertrand DeJarnette, DO, DC, the developer of sacro occipital technique, felt research was an essential part of being a chiropractor and necessary for the future of the chiropractic profession. As early as July 1935, Major DeJarnette was a featured speaker presenting clinical research at the 40th Anniversary Convention 1895-1935 of the National Chiropractic Association. Research was always 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]."

"Research in chiropractic must go on forever. Someone must do this type of work, for it simply will not take care of itself. A profession cannot stand still. Momentum must constantly be generated. Chiropractic research needs many things it does not now have[2]." DeJarnette concluded that, "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]."

With all of this in mind, I wish to share clinical case studies from these conferences so that they may spark an interest in a topic and help a doctor treat a specific clinical presentation. I also hope it encourages a doctor who has treated an interesting case to share this with the whole chiropractic community in the form of a published case report. In this article, we will review three studies from the first Sacro Occipital Technique



Research Conference in 2009. During the course of sharing these articles, there also will be a focus on discussing specific terminology so we can better place case reports in their proper place in the development of evidence-based practice for the chiropractic profession.

Case Report #1: Sacro occipital technique, stability testing, and tai chi or yoga: A case report.

Both yoga and tai chi can help patients with specific joint difficulties to find ways of performing exercise at their personal limits and still develop improved flexibility and stability. A 65-year-old female presented with generalized back and neck pain. She noted that when performing tai chi and yoga, she could not accomplish movements that included flexion at the hip while standing.

Evaluation demonstrated a sacroiliac joint hypermobility syndrome and treatment focused on supine pelvic block placement with functional reassessments. Following the first office visit for this condition, the patient immediately demonstrated a well-balanced "tree pose," but could only accomplish the kicking portion of the tai chi movement when sacroiliac trochanter belt was applied.

Study Implications: Utilizing yoga and tai chi postures may help a patient determine when chiropractic care may be appro-

priate and sets up a patient-driven healthcare interaction, which is preferable to both doctor and patient.

Case Report #2: Alterations of dyspeptic signs and symptoms on patients presenting with gastroesophageal reflux disease receiving chiropractic treatment.

Knowledge on the incidence, prevalence, and natural history of gastroesophageal reflux disease (GERD) is limited. The objective of this study was to investigate the alterations of dyspeptic signs and symptoms in patients presenting with GERD following chiropractic treatment.

The study sample was composed of 10 individuals sent for chiropractic treatment by a gastroenterologist surgeon. A high digestive endoscopy exam was performed on all individuals before and after eight sessions of chiropractic manipulative reflex technique (CMRT) treatments. A GERD symptom questionnaire and the results from high digestive endoscopy exams were used to evaluate dyspeptic signs and symptoms.

At the end of chiropractic treatment, a statistically significant global reduction of GERD symptoms was observed (p=0.0002), especially on the evaluation of pre and post-treatment postprandial pyrosis data (p=0.000004). Through endoscopic examinations on the 10 patients, the findings noted a 58% improvement of esophagitis caused by GERD.

Study Implications: These types of studies help support chiropractic care of nonmusculoskeletal conditions and suggest that chiropractic may affect reflex responses of the autonomic nervous system, which in turn may alter visceral functioning.

Case #3: Sacro occipital technique, cranial technique, "faux" fibromyalgia syndrome, and self-reported improvement in vision: A report of four patients.

This case series includes reviews of four patients who presented previously as diagnosed with fibromyalgia syndrome (FMS). Based on the patients' response to care, the patients were later rediagnosed as having a condition better described as a fibromyalgia mimicry or "faux fibromyalgia" syndrome (FFMS).

Treatment consisted of category two (sacroiliac joint instability) analysis and treatment, SOT® extremity techniques, and cranial sutural analysis and treatment. Weeks later, as the patient's symptoms stabilized, therapy rehabilitative exercises were employed using therapeutic bands and a "rebounder." Within six weeks of SOT and cranial care, symptoms resolved for these four patients to the point that, as long as they were within a few days of receiving care, they were asymptomatic. As their FFMS symptoms resolved a concurrent improvement in vision that involved improved acuity or color discernment.

Study Implications: As study increases in chiropractic myofascial and neurological relationships, we may better gain a grasp of why some patients presenting with musculoskeletal conditions may have simultaneous, self-reported positive nonmusculoskeletal results, such as an improvement of vision.

I hope to share regular updates of articles that have been presented at the SOT® research conferences as a means to stimulate thought, offer some clinical insights, and suggest avenues for further research and exploration.

"At the end of chiropractic treatment, a statistically significant global reduction of GERD symptoms was observed (p=0.0002), especially on the evaluation of pre and post-treatment postprandial pyrosis data (p=0.000004)."

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SOT

Sacro Occipital Technique Research Updates

Second Edition

By Charles L. Blum, DC

This is the second in a series of articles that will attempt to share various concepts of research with doctors in clinical practice and focus on the value and limitations of case reports. The case report is a very special way doctors in clinical practice can attempt to communicate with our research communities by sharing what happens in the clinical "trenches."

Robert W. Ward, DC, past editor of the *Journal of Chiropractic Education*, described the importance of a case report in the following way: "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)[1]."

Before we tout the wonder of the case report, though, there are many kinds of limitations with this type of study that need to be understood so that the results described by these studies are not overinterpreted. For instance, one reason case reports are considered anecdotal is that there are no control groups or comparative treatments to help mitigate the placebo or ideomotor effect.

Control Groups

Ideally, a control group is a group within a comparative study that has had either no intervention or a sham procedure, or some studies have both. A sham procedure is supposedly an intervention that has no therapeutic effect. This was a particular issue with chiropractic when a study by Balon et al. found no benefit of chiropractic care for asthma, since both the sham (massage) and chiropractic intervention had the same benefit[2]. However, just a few months later, a study by Fields et al. found that parental massage for asthmatic children had a therapeutic effect[3].

This called into question the sham procedure used in the Balon study and the conclusions drawn by those authors. Generally, a study with a control and sham procedure is more effective when both the examiner and subject are unaware (blinded) of a manual healthcare intervention; however, in most clinical studies, this is very difficult or virtually impossible. While sham interventions and blinding is relatively easy with inert red and blue pills, it represents a challenge to adequately study chiropractic clinical interventions[4].

Placebo Effect

The placebo effect suggests that a subject's response to an inert intervention can be dependent upon the subject's perception and expectation. de Craen et al. found that the color and size of the placebo pill makes a difference, with "hot-colored" pills working better as stimulants while "cool-colored" pills work better as depressants[5]. The challenge for manual healthcare interventions and ruling out a placebo effect is that most hands-on interventions have some kind of an effect, and this makes using placebos in manual healthcare studies problematic.

Bialosky et al. even took this concept a bit further by suggesting "that manual therapists conceptualize placebo not only as a comparative intervention, but also as a potential active mechanism to partially account for treatment effects associated with manual therapy[6]." While positive suggestions and attitudes may help stimulate a patient's "placebo effect," critics then find it difficult to isolate a patient's therapeutic response to just a specific manual healthcare intervention.

Ideomotor Effect

The terms "ideomotor effect, response, and phenomena" were introduced by William Benjamin Carpenter in 1852 as a means to explain his theory of how muscular movement can be independent of conscious desires or emotions[7]. Hyman described how the ideomotor effect demonstrates that "honest, intelligent people can unconsciously engage in muscular activity that is consistent with their expectations[8]."

Ultimately, this effect suggests that research using human subjects, where the examiner and subject are not blinded, can often lead to findings unconsciously directed by the examiner and unconsciously performed by the subject. This is a common critique of case reports and of doctors in clinical practice claiming successes for their interventions.

How can a doctor in practice run a full-scale study incorporating control groups to help rule out the placebo and ideomotor effects? Without research experience and developing a prospective research design for a case report, a doctor in practice often is left with retrospective case reports that discuss an interesting intervention or response to treatment. Sometimes, though, there are novel case studies that on some level attempt to find ways to address controls or comparative interventions and placebo or ideomotor effects.

Case Report One[9]:

Case History: A 37-year-old female was seen for benign paroxysmal positional vertigo (BPPV) referred by her allopathic physician for chiropractic care. The patient had two to three months of constant vertigo, which was unresponsive to medications and prohibited her from driving or walking without difficulty.

Interventions/Results: She presented with sacroiliac joint hypermobility syndrome (category two), right temporal bone restricted in external rotation, and significant malocclusion with clenching. Sacro occipital technique category two protocols for the pelvis were applied along with cranial and TMJ therapies. Dental cotreatment was necessary to sustain the cranial and TMJ corrections. By the seventh office visit (three to four weeks of care), the patient's vertigo had resolved, her category two stabilized, and TMJ translation had improved without pain.

Implications: In this case, the interesting aspect was that the patient had consistent symptoms for two to three months and was unresponsive to medication. In a way, the medication became a comparative intervention and the length of symptomatology suggested that the treatments rendered might have been related to the patient's improvement.

Case Report Two[10]:

Case History: A 42-year-old female presented with an unsteady Parkinsonian type of gait diagnosed as psychogenically driven. She also was diagnosed with an atypical version of a complex regional pain syndrome (CRPS) called complex pain syndrome (CPS) due to its whole body generalization, as well as having a history of migraines.

Methods/Results: The patient was co-treated with dental night- and daytime appliances, and a trochanter belt. She also was treated with category two protocols for sacroiliac joint hypermobility, sutural cranial temporomandibular joint (TMJ) interventions, T8 chiropractic manipulative reflex technique (CMRT), and nutritional modifications to support liver function and reduce inflammation. At the first office visit with the dental appliance, trochanter belt, and category treatment, all of her shaking stopped when standing and her pain was profoundly reduced.

Implications: What is compelling with this patient is that she had symptoms that had lasted for years and was on multiple medications for various symptoms with no change. It is significant that at the first office visit with the dental and chiropractic treatment, as well as the sacrotrochanter support, her chronic tremor stopped. Furthermore, the tremors were controlled with care, and when she was unable to receive care, her symptoms would return. A confounder is that her condition was presumed to have a psychogenic component which suggests her response to treatment may be due to a placebo or ideomotor effect.

Case Report Three[11]:

Case History: A 10-year-old female cattle dog with known chronic symptoms of bloating, mood changes, joint pain, and chronic psoas tension, all of which were unresponsive to prior interventions, presented for chiropractic care.

Methods/Results: Occipital fiber analysis (OFT), a part of sacro occipital technique, was used to assess the canine and treatment consisted of chiropractic manipulative reflex technique (CMRT). Following the occipital analysis and treatment procedure, the reflex pain areas were diminished significantly. The dog also was relaxed, with decreased joint pain, and the psoas tension was notably reduced, as determined by both the canine's owner and treating physicians.

Implications: One reason why researchers use animals for studies is presumably because animals don't understand (are blinded to) the types of interventions being performed on them. For that reason, the canine's response to chiropractic care, when she was unresponsive to veterinary care, suggests that the intervention was the cause for improved function and symptoms. Even so, some research suggests that animals may still be susceptible to the placebo effect[12].

Ideally, the goal of the case report is a way of developing modes of communication between doctors in clinical practice and those in research who are not commonly treating patients. Like all research studies, some case reports may yield greater applicability for further study, and the hope is that as more information is shared in the evidence-based arena, the outcome will be improved delivery of health care.

The Sacro Occipital Technique Research Conference offers doctors the ability to share various ideas that can improve assessment and treatment applications assisting patient response to care. The welcoming of new ideas and sharing of interdisciplinary relationships makes contributing to and attending this conference a valuable opportunity for the doctor in clinical practice. This year's conference will be held in Redondo Beach, California on May 15, 2014. Please visit: www.SOTO-USA.org for more information.

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SOT

Sacro Occipital Technique Research Updates

Third Edition

By Charles L. Blum, DC

This is the third in a series of articles that will attempt to share various concepts of research with doctors in clinical practice and focus on the value and limitations of case reports. As chiropractic enters the twenty-first century, it is important that chiropractors embrace the advances of what research can offer them. To do this, it becomes necessary that we are educated clinical practitioners who can more fully discern the value of information yielded from patient encounters in order to better understand the effects of what we do in practice.

Interestingly, what we need to use as guides when reading case reports is also what we need to use when treating patients in our offices. This is because, on some level, every patient we see is a research study in progress. We assess what we think is going on with the patient, apply an intervention, and then reassess the patient. There are ways of looking at our office visits in different ways, which may help us better grasp what actually may be taking place when we see a patient. Concepts such as regression to the mean, washout periods, and temporal relationships can assist us when assessing the value of interventions for our patients.

Regression to the Mean

The term "regression to the mean" is used in statistics to explain that if a patient's first response to an intervention may be highly unusual, then it may be closer to their average on the second. Conversely, if the patient's presentation is highly unusual on the second intervention, then it was likely closer to the average on the first.

Regression to the mean can compromise any investigation when there is not an appropriate control (group) to assess whether an intervention actually had an effect or if the patient was coincidentally recovering from an unusual physical episode, regardless of the intervention. Since this is a common effect in research, it must be considered with our chiropractic interventions and a patient's response in a clinical setting[1].

Washout Period

A "washout period" is a period in a clinical study during which subjects receive no treatment for their presenting symptoms, while under study, and the effects of any previous treatment are eliminated (or assumed to be eliminated)[2]. Washout periods happen inadvertently, such as when a patient positively responds to care, then is unable to receive care for a few weeks, and notices his/her symptoms worsening. Then when the patient returns and receives care, the symptoms improve again. In this instance, a patient's extended time between office visits becomes one type of washout period.

Temporal Relationship

A "temporal relationship" occurs when an intervention occurs and is presumably closely followed by an effect. In clinical research or even in our clinical practices, we tend to assume that when a patient has a response shortly after a treatment, the response is related to the treatment.

What ultimately becomes important is determining the difference between cause and coincidence. Just because there is a temporal relationship between a treatment and a patient's response, it does not always mean the treatment caused the effect. That is why we use multiple tools in research or in our offices with patients to help determine what does and doesn't work for a patient. For that reason, we may try to hesitate before assuming a patient's response to care was not a "regression to the mean." In addition, before drawing a conclusion about the care rendered, we may even want to try a "wash out period" to help discern if the patient may have been getting better even without our care.

The following studies from the SOT Research Conferences may help better illustrate these specific concepts.

Case Report One[3]

Case History: A 34-year-old woman presented for chiropractic care in June 2010 with a primary complaint of chronic inner ear congestion of a 17-year duration. Also of interest, she had

other conditions as well: Ehlers-Danlos syndrome (HT-EDS), type 2 diabetes, migraines, polycystic ovarian syndrome, celiac disease, and general disorientation.

Methods/Results: On examination, sacro occipital technique (SOT) indicators diagnosed a sacroiliac joint hypermobility syndrome with pelvic torsion (category two). Cranial palpation revealed sphenoid, right maxilla, and left occiput imbalance. The treatment consisted of SOT psoas release techniques, trapezius fiber analysis and treatment, and category-two block placement. Cranial therapeutic treatment focused on the sphenoid as well as balancing of dural membrane tensions and CSF pulsations. Within 20 minutes of the office visit, the patient reported that her ear "opened up" for the first time in 17 years. The condition was then stable for at least one week posttreatment and the patient was did not return for care for follow up assessments.

Implications: With this complex case, it is interesting that the patient had a chronic condition for 17 years. During this time, it would be expected that issues of regression to the mean and washout periods would have occurred to assess cyclical changes or any prior intervention. Also, the persistence of the condition and the response, 20 minutes following care, suggests a temporal relationship between the intervention and her symptomatic response. While she was stable for one week following the treatment, further follow up with this patient would be important to discern if the positive response was sustained.

Case Report Two[4]

Case History: Asthma is a multifactorial dysfunction that may need interdisciplinary care for comprehensive treatment. The patient is a 63-year-old active female, and her height is 5' 3" and weight is 112 lb. She rates her general health level as a 9 out of 10, with her only discomfort being a long history of asthma and shortness of breath.

Methods/Results: Chiropractic interventions involved sacro occipital technique category-one treatment, reduction of costal torsion (T3-6), and diaphragm and craniofacial balancing. Acupuncture treatment focused on the lungs, points to "open the chest," and master empirical points for the head, neck, and sinuses were also used. Following treatment, the patient could return to her full activities of daily living, eliminated the need of her asthma medication, and was able to respond to stressful situations without asthma flare-ups. With periodic supportive care[5], the patient's symptoms were controlled with flare-ups only occurring when the length between treatments exceeded more than four to six weeks.

Implications: With regression to the mean, we could expect cyclical improvements and worsening of a patient's condition without care, but if treatment was effective, we would expect a relationship of improvement with treatment and worsening as time between treatment increases. On some level, a washout period was occurring between office visits and an optimal period for when treatment was needed. Supportive care[5] is an important concept for treatment of long-term chronic conditions, which have been unresponsive to other interventions. Supportive care differs from maintenance care because it is based on determining the most minimal level of care needed to sustain a patient's activities of daily living and quality of life.

Case Report Three[6]

Case History: A 54-year-old male patient presented with severe pain in the epigastric area that was worse with deep breathing, eating any food, and unremitting persistent upper abdominal aching, fullness, and throbbing pain. The patient was unable to sleep due to pain, and he could do nothing to relieve his pain or discomfort. The condition had persisted for three days before he sought treatment at this office.

Methods/Results: Treatment involved adjustment of "anteriorities" in the T11-L2 region, releasing of diaphragmatic tension in the mid and left lower rib region, sacro occipital technique (SOT)'s chiropractic manipulative reflex technique (CMRT) for T5, hiatal hernia release technique (gently pulling the stomach downward during exhalation), and solar plexus technique. Immediately upon pulling the stomach downward, the patient sighed and said he could breathe comfortably for the first time in three days, and approximately two minutes later, the constant tension in the epigastric area was also gone. The following week, he indicated he was eating and functioning normally without discomfort. At the two-year follow-up, he indicated the condition had never returned.

Implications: The temporal relationship between the unremitting discomfort the patient experienced for days, the treatment, and immediate response is compelling to suggest that there was a cause and effect to the intervention. Chiropractic care for nonmusculoskeletal conditions is a challenging hill to climb from a research standpoint because sometimes nonmusculoskeletal conditions are diffuse and chiropractic treatment may have a nonspecific but positive effect.

Using concepts of regression to the mean, washout periods, and temporal relationships can help us better assess case reports and their significance, as well as what is taking place in our offices with our patients. It is always important to question whether what you are doing therapeutically is actually creating the change that you presume is happening. This self-questioning strategy may help you discern how often you actually need to see a patient, how to develop ergonomic modifications or rehabilitative exercises for your patient, and if you may need to cotreat with another practitioner. In the next article, I will discuss chiropractic care of nonmusculoskeletal conditions—the challenges and the successes.

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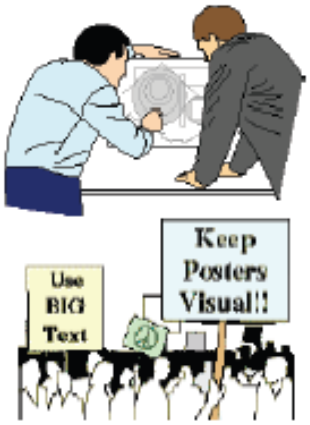
Effective Scientific Posters: Quick Reference

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.

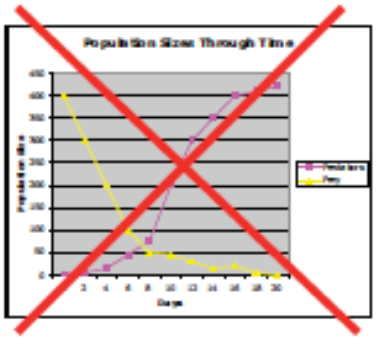
Posters serve as …
» a source of information
» a conversation starter
» a summary of your work
» an advertisement of your work



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!



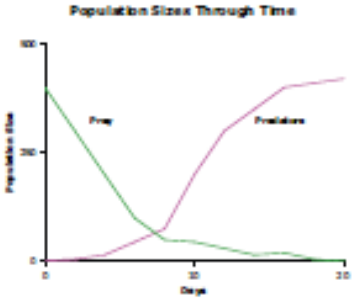
Desired message: Prey decreased as predators increased.
Focus on relationships – exact values are usually not important.

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

1. **Block SM. Do's and dont's of poster presentations.** *Biophysical Journal*. 1996; 71: 3527-9.
2. **Harms M. How to prepare a poster presentation.** *Physiotheraphy*. 1995; 81(5): 276.
3. **Hess GR, Brooks EN. The class poster conference as a teaching tool.** *Journal of Natural Resources and Life Sciences Education*. 1998; 27: 155-8.

New Orleans, Louisiana – May 2015

Call for Scientific Submissions
Sacro Occipital Technique Organization - USA
7th SOT Research Conference, May, 2015

This call for scientific submissions invites the submission of original research that will promote the dissemination and discussion of new information. The categories for the 2015 conference are:

1. **Research (Integration)** integrated/integrative healthcare, integration related research topics (e.g., policy, healthcare programs, quantitative/qualitative research, etc.)

2. **Research (Basic Science)** (e.g., experimental trials, quantitative basic science research, etc.)

3. **Research (Clinical/Health Care Systems)** (e.g., experimental clinical trials, quantitative clinical research, case reports, qualitative clinical research, public health, etc.)

4. **Research (Innovative)** (e.g., experimental sacro occipital technique or cranial integrative methods assessed with reliable and valid assessment tools, etc.)

Submission Requirements

1. **Blinded submission for peer review - due electronically January 31, 2015**

a. The submission must be a completed study. Incomplete work (e.g., concept proposal, a proposed idea for a research project that has not begun yet, a project has started but no data) will not be considered. If you are uncertain or have any questions about this, please contact the Peer Review Chair prior to the submission deadline.

b. Word limit: submission may be up to approximately **2000 words** (but may be shorter). The 2000 word count allows authors to demonstrate the data/results of their findings and the scholarship quality of their completed work. One file in Word or rich text format (RTF), 12-point type font, double-spaced, maximum 2MB.

c. Do not include author names or institutional affiliations anywhere in title or text.

d. The submission must include appropriate sections such as: Title, Introduction (e.g. Background, Objectives, Purpose), Methods, Results, Discussion, Conclusion, and References sections. References are expected, but are not included in the word count.

e. Due to file size limitations, it is preferred that you submit up to 2 of any combination of the following embedded in the Word/RTF document: diagrams, figures, pictures (JPEG, TIFF or BMP), graphs or tables (e.g. one graph and one table.) Only submit these if they are essential for the peer reviewers to evaluate the

proposal. Do not submit tables, graphs or pictures as separate files. Do not submit other visual aids (no videos or power point).

f. Your accepted paper will be published in the Sacro Occipital Technique Research Conference Proceedings 2012 but you will not sign over copyright to this conference and reserve the right to publish your article at another research conference or journal.

2. **Abstract for proceedings if accepted and author information - due January 31, 2015**

a. The abstract should be a structured abstract and include appropriate sections such as: Introduction (e.g. Background, Objectives, Purpose), Methods, Results, Discussion and Conclusion sections.

b. Word limit: **200 words maximum**. No pictures, tables, figures, or references are included in the abstract.

c. Do not include author information or institutional affiliations in the abstract.

d. The abstract will be published on the *SOTO-USA.org* website and within the SOT *Compendium of Peer Reviewed Literature 2010-2015* if submission is accepted.

3. **Signatures of all authors - due postmarked or faxed by January 31, 2015**

a. Signatures of all authors shall be submitted on the authorship statement form

b. Presentations of accepted works are expected. Presenting author(s) must register and attend the conference to present. Only authors may present the study. All presenters must register for the conference. We strongly recommend that funding is secured or confirmed in advance of submission. Submission is a commitment for presenting authors of accepted submissions to attend the conference and be present at the scheduled session.

4. **For studies involving human subjects – a copy of IRB/Ethics approval, expedited, or exemption letter – due postmarked or faxed by January 31, 2015**

a. All studies involving human subjects must go through appropriate IRB/ethics review and state these processes in both the blinded submission and abstract. Case reports are exempt. Any questions should be directed to your institution's IRB or Ethics Committee.

b. For studies involving human subjects research, provide a photocopy of the approval, expedited review or exemption to the peer review chair. For studies not involving human subjects, this document is not required.

Submissions that do not meet the above requirements will be returned to the submitter.

Submission Information

All paper submissions shall be submitted electronically via email to Dr. Charles L. Blum – drcblum@aol.com. A website link relating to the SOT Research Conference and registration for this conference will be posted on the website www.soto-usa.org. The primary author is responsible for proper submission of all items. Non-authors (e.g., staff) are not allowed to submit or query about submissions.

Important Information:

1. If the submission does not meet the submission requirements (e.g., not a completed research study, missing items), the SOT Research Conference Peer Review Chair will contact the authors. If however the paper cannot be accepted for this conference then notification will be sent to the submitting author. Concept proposals and incomplete works will be returned to the authors and those authors can contact Dr. Blum at drcblum@aol.com for further information.

2. It is the responsibility of the primary author to ensure that all requirements are met. The primary author will be the contact person responsible for submission of all required materials and all correspondence. Do not send communications through a third party, staff member, or co-author.

3. If the Peer Review Board confirms that there is an inappropriate submission, it will be disqualified. Examples of inappropriate submissions include but are not limited to: one that has been presented before at this conference, incomplete submissions, concept proposals, duplicate submissions, no human subjects/ethics review when one was necessary (includes expedited review), non-authors listed as authors, plagiarized work, etc.

4. Only electronic submissions will be considered. No faxed or mailed submissions will be considered.

5. Presentations of accepted works are expected. Authors must register and attend the conference to present. An author who does not register and present an accepted work will be disqualified from submitting/presenting for the following 2 years. It is the author's responsibility to find funding to register and attend the conference. We strongly recommend that funding is secured or confirmed in advance of submission. Presenter information and registration for the conference is required or the invitation to present will be revoked. Only authors may present their work at the conference.

6. Due to time and space limitations, and ability to cover poster presentations, there may be a limitation for the number of poster presentations per primary author/presenter.

All submissions will be evaluated for completeness, strength of contribution to the profession and relevance to the SOT research conference. Submissions will be reviewed by the peer review committee based upon the following criteria:

1. Practical significance
2. Originality
3. Theoretical/conceptual framework
4. Quality of experimental or descriptive design
5. Discussion/findings/results - clarity of presentation of findings
6. Conclusions, interpretation of results, implications for chiropractic education, theory, research, or practice
7. Citation of appropriate literature
8. Applicability for: the chiropractic profession, classroom use, further research, current/critical concerns, etc.
9. Completed study
10. Overall rating of the paper.

Notification: Primary/corresponding authors will be notified of peer review results by April 2015. If accepted, an acceptance communication and other information of the presenting author must be returned to the peer review committee. For submissions that are accepted, an author is required to register and present the work at the conference. If you have any questions or would like to request forms please contact the Peer Review Chair: Dr. Charles L. Blum at drcblum@aol.com

OTHER INFORMATION:

If accepted, the **200 word** maximum *abstract* will be printed on the SOTO-USA.org website and within the *Sacro Occipital Technique Compendium 2010-2015. The paper will be published within the proceedings of the* SOT Research Conference 2015. This will still allow you to publish your completed paper in any journal you wish.

Email a pdf or jpeg scan to drcblum@aol.com, or fax this completed by **January 31, 2015** to:

SOT Peer Review Committee 2015
Attn: Charles L. Blum, DC Peer Review Chair
Email: drcblum@aol.com
Multiple authors involved with one submission may send their forms in separately

The following two submission forms can all be found on the SOTO-USA website by going to www.SOTO-USA.org and clicking on SOT Research Conference Proceedings Submission box.

Authorship Signatures Form

Sacro Occipital Technique Research Conference VII

May, 2015

INSTRUCTIONS: This form must be completed, signed, and submitted by **January 31, 2015**
Submission title (print):

_____

By signing this form:
1. I/We confirm that each of us qualify as an author of this submission, am/are responsible for all of its content, and give permission for: 1) its presentation if accepted to the SOT 2013 research conference, 2) the publication of the *abstract on the SOTO-USA.org* website and within the SOT *Compendium of Peer Reviewed Literature 2010-2015*, 3) your accepted paper to be published in the Sacro Occipital Technique Research Conference Proceedings 2015 but you will not sign over copyright to this conference and will retain the right to publish your article at another research conference or journal, and 4) am/are capable of presenting/defending all of its content (for information about authorship visit www.icmje.org)

2. If accepted, I/we understand that registration and presentation of this work at the conference is required and that funding should be secured or confirmed in advance of submission. Submission is a commitment for presenting. Authors of accepted submissions must attend the conference and be present at the scheduled session. I/We understand that withdrawing after acceptance may prevent us from submitting to future SOT Research Conferences.

For studies involving human subjects – a copy of IRB/Ethics approval, expedited, or exemption letter – due postmarked or faxed (310-478-1918) by January 31, 2015.
Evidence of IRB or ethics review approval/exemption is required for all research studies involving human subjects. It is recognized that projects that use human subjects are expected to follow appropriate human subjects review procedures depending on the type and nature of the research (more information about human subjects review/ethics review/IRB can be found at http://cme.cancer.gov/c01 and http://ohrp.osophs.dhhs.gov/irb/irb_guidebook.htm).

Primary Author Print name Email address Signature Date
Other Authors Print name Email address Signature Date

_____

_____

_____

If more authors, please sign and date on an additional form. If multiple authors, each may send in their completed forms separately (need not be on the same form).

Patient Case Consent for Publication and Presentation

Title of case study/series:

_____

Author(s)
names:_____

As the patient in this case study/series, I hereby give my consent for clinical information relating to my case to be reported at a scientific conference, in a conference proceedings, and/or published in a scientific journal.

I understand that my name, initials, and/or any protected health information such as my identification number, billing information, address, etc. will not be published and that efforts will be made to conceal my identity, but that anonymity cannot be guaranteed.

I understand that the material may be published in a journal, a website of a journal, and/or in products derived from the publication. As a result, I understand that the material may be seen by the general public.

_____ _____
Name of patient (print) Date

_____
Signature of patient (or signature of the person giving consent on behalf of the patient if patient is a minor or deceased)

If you are not the patient, what is your relationship to him or her? (The person giving consent should be a substitute decision maker or legal guardian or should hold power of attorney for the patient.)

_____

Why is the patient not able to give consent? (e.g., is the patient a minor, incapacitated, or deceased?)

_____

If images of the patient's face or distinctive body markings are to be published, the following section must also be signed in addition to the section above:

As the patient stated above, I give permission for images of my face or distinctive body markings to be published and recognize that I might therefore be identifiable even though my name and initials will not be published.

_____ _____
Signature of patient (or signature of the person giving consent on behalf of the patient) Date

Please keep a copy of this completed form for your records.