The AAO

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TRADITION SHAPES THE FUTURE VOLUME 18 NUMBER 4 DECEMBER 2008

Contemplations on the Art of OMT After Thirty Years of Practice

Karen M. Steele, DO, FAAO Presents the 2008 Northup Lecture

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Correction to "Improvement of L4-L5 disc positioning following treatment with orthotics used to correct gait dysfunction and level the sacral base", *AAOJ* Vol. 18, No. 3

The original article displayed an image on page 22 was dated incorrectly. The images on the right side was mislabeled and should read Figure 2.MRI of lumbosacral spine taken on July 19th, 2007.

This correction is made to maintain the integrity and scholarship of this article in particular and *The AAO Journal* in general. Fortunately, the date confirms no intervening treatment alluded to on page 23 paragraph one.

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IN THIS ISSUE:

Contributors

Krishnahari Pribadi, MD, ABPN Diplomate
"The detection and recording of cranial rhythmic impulse in acupuncture points using Surface Scanning Laser Displacement Meter and it's significance."
Osteopathy in the cranial field continues to be controversial in some circles, yet at the same time is probably one of the most researched areas in the profession. In recent years instrumentation using Doppler technology, strain gauges, and now the Surface Scanning Laser Displacement Meter have emerged as instruments that could be validated for objective measurement of the cranial rhythmic impulse, thus allowing far better research in this area than ever before possible. Dr. Pribadi uses such technology to measure correlations between the cranial rhythmic impulse and acupuncture meridiens to illustrate interconnections between these two systems.

Karen Steele, DO, FAAO, Professor and Associate Dean for Osteopathic Medical Education, West Virginia School of Osteopathic Medicine
"Contemplations on the Art of OMT After Thirty Years of Practice."
In the 2008 Northup Lecture, Dr. Steele talks about the art of osteopathic practice, and specifically addresses what she feels are unique attributes that DOs bring to patient care. All this is based on her reflections on thirty years of practice in osteopathic medicine. She uses the art of pottery making as a metaphor to illustrate her lessons learned over the years. Her discussion provides valuable insight into how we can all strive to better master the art of osteopathic practice.

Michael Lockwood, DO, Eric Snider, DO, and Michael Chipman, OMS IV, Department of Osteopathic Manipulative Medicine, Kirksville College of Osteopathic Medicine
"Retrospective Study of a Peer Assessment Education Encounter in the Development of Osteopathic Clinical Skills."
The word "doctor" comes from the Latin verb "docere", meaning "to teach". At one time or another most of us were taught that as doctors an important part of our job is to teach: to educate patients, for example, and to educate future osteopathic physicians. The authors of this article describe a clinical educational experience that allows first and second year osteopathic medical students to teach each other, to learn from each other, and at the same time to improve and validate their osteopathic manipulative treatment skills.

Regular Features:

DIG ON. Richard L. Van Buskirk, DO, PhD, FAAO
Muscle Impulse, A Muscle Energy Variant
This paper describes a new osteopathic manipulative method, Muscle Impulse. The technique appears to be a variant of the Muscle Energy Technique but is faster and requires less resistance from the operator and less effort from the patient.

AAO Seeks New AAOJ Editor and Associate Editor

In July of 2008, Robert C. Clark, DO experienced an unexpected illness. Recognizing that the need to rest more, most will agree that Dr. Clark's family and practice come first and will understand that his volunteer activities must be curtailed, preventing him from having sufficient time to serve out his current three-year term (calendar years 2007-2009) as Editor of the AAO Journal, Dr. Clark notified AAO President Guy A. DeFeo, DO that he would end his service with the September 2008 edition of the AAOJ.

Dr. DeFeo invites interested AAO members to submit a cover letter and curriculum vitae to the AAO Board of Trustees, who have the responsibility for appointment of the journal editor and associate editor. Assuming there will be multiple qualified candidates, the Board may wish to conduct interviews at the 2009 AAO Convocation in Little Rock, Arkansas. Candidates should submit a cover letter and CV to AAO headquarters, postmarked no later than Friday February 15, 2009. In the cover letter, the candidates should explain why they wish to serve in this important post and document professional experience that would qualify them for the job.

The AAOJ Editor and Associate Editor serves without compensation. He/she is appointed to a three-year term and charged with the responsibility of publishing a quarterly journal within the annual budget appropriated by the Board of Trustees. The Editor will be responsible for soliciting contributions, submitting them to peer review, and selecting the final material for publication. The Journal Editor will have recourse to the advice and assistance of the Editorial Advisory Board, the Publications Committee and the AAO executive director. The Editor works with the AAO staff, particularly the Communications Director, to write various columns, proof blueline drafts, and meet publication deadlines, i.e. the first day of March, June, September, and December. While there is considerable latitude given to the Journal Editor, the Board of Trustees will expect continued evolution of this professional journal with the long range goal to have it included in the National Library of Medicine's Index Medicus.

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From the Pyramids

Raymond J. Hruby

"Just when I thought I was out…they pull me back in." Thus I am reminded of this quote, uttered by Don Michael Corleone (a.k.a. Al Pacino) in the 1990 film "The Godfather: Part III" (along with my apologies for ending a sentence with a preposition!). As some of you already know, I was the founding editor of *The AAOJ* and remained so for 10 years. At that point the editorship was passed to Anthony Chila, DO, FAAO, and more recently to Robert Clark, DO. Recently, Dr. Clark informed us that he needed to step down as the Editor-in-Chief of the Journal for personal reasons. He sent us a statement about his situation, which reads as follows:

> "The September 2008 issue is my last as the editor in chief. In July, I had an unexpected illness. Although mercifully short, it has had some lingering effects. I do not have the stamina that I had before. Fortunately, that is improving albeit slowly. I have been forced to examine my life and prioritize my activities. For the past three years my practice has been half time. This gave me time for various professional and personal activities. With the need to rest more, there were too many things in my personal life that were not getting done. Most will agree that my family and practice come first and will understand that my volunteer activities must be curtailed. Based on that premise, I have resigned as editor in chief of *The AAO Journal*".

We wish Dr. Clark all the best, hope that he is doing well, and thank him for the outstanding job he did as Editor-in-Chief of the Journal these past years.

When all this occurred, I was contacted by the AAO leadership and asked if I would step in as interim Editor-in-Chief in order to make sure *The AAOJ* stayed on track and we met publication deadlines on time. I agreed to do so, and the AAO leadership is planning a strategy for the future of *The AAO Journal*.

While all of this is going on, I also recently stepped down from my full time position as Chair of the OMM Department at the Western University College of Osteopathic Medicine of the Pacific (COMP), and am now working on only a part-time basis at the University. Although I do have lots of other plans for my time, this does allow me some room to take on the *AAOJ* Editorship without too much difficulty. My part-time activities at COMP primarily involve doing faculty development with the newly hired OMM faculty and the Predoctoral Teaching Fellows, and doing some curriculum development and analysis for the department. I do plan on doing some other writing and publishing, but all in due time.

An unusual thing (perhaps an omen of sorts?) happened to me while working on this issue of *The AAOJ*. I started writing this editorial page while at the COMP campus the other day, and while there I stopped into the OMM department library to look at some of the past issues of the Journal for inspiration. The very first issue I picked up was from December 1998 -- exactly 10 years ago! Do you remember what was in that issue? I didn't either. Here is a listing of the major articles published in that issue: "The Early History of Osteopathy", by Dennis Dowling, DO, CSPOMM (who has since earned his FAAO); "How Does our Profession Get 100,000 Cases of Influenza Reported?", by Deborah M. Heath, DO, and Albert F. Kelso, PhD; The Thomas L. Northup Lecture: "The Tree and the Wind: A Fable of Osteopathic Growth and Destruction", by Eileen L. DiGiovanna, DO, FAAO; "Is Human Cerebrospinal Fluid Reabsorbed by Lymph? Lymph Drainage Therapy (LDT) and Manual Drainage of the Central Nervous System", by Bruno Chikly, MD; and "Evolving Strategies for Management of Various Musculoskeletal Disorders: Evidence-Based Approaches and Beyond", by Wolfgang G. Gilliar, DO.

In my editorial page in that same issue I discussed osteopathic unity. I have always been impressed at how the leaders and members of the AAO can always come together in times of need, much like now when there is a need to step in and keep the Journal a growing, vibrant entity within our organization. I made note of the fact that we could all learn some valuable information about unity by observing flock of geese flying in formation. I quoted an excerpt from an address first given by anthropologist Angeles Arrien and published in the newsletter of the Maryland Association of Extension Home Economists. The excerpt is as follows:

> Fact 1: As each bird flaps its wings, it creates a uplift for the bird following. By flying in a "V" formation, the whole flock adds 71% greater flying range than if one bird flew alone.
>
> Lesson 1: People who share a common direction and sense of community can get where they are going quicker and easier because they are traveling on the strength of one another.
>
> Fact 2: Whenever a goose falls out of formation, it suddenly feels the drag and resistance of trying to fly alone and quickly gets back into formation to take advantage of the lifting power of the bird immediately in front.
>
> Lesson 2: If we have as much sense as geese, we will stay in formation with those who are ahead of where we want to go and be willing to accept their help as well as give ours to others.
>
> Fact 3: When the lead goose gets tired, it rotates back into formation and another goose flies the point position.
>
> Lesson 3: It pays to take turns doing the hard tasks and sharing leadership.
>
> Fact 4: The geese in formation honked from behind to encourage those up front to keep up their speed.
>
> Lesson 4: We need to make sure our honking from behind is encouraging and not something else.
>
> Fact 5: When a goose gets sick wounded or shot down, two geese drop out of formation and follow it down to help and protect it. They stay with it until it is able to fly again or dies. Then they launch on their own, with another formation, or catch up with their flock.
>
> Lesson 5: If we have as much sense as geese, we, too, will stand by each other in difficult times as well as when we are strong.

Lessons from geese. We can still learn from them, as much now as back then.

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*The AAO has requested that the AOA Council on Continuing Medical Education approve this program for (the identified number of) hours of AOA Category 1-A CME credits.

December 5-7, 2008
Osteopathic Approach to Cranial Nerve Dysfunction ala Barral
Pomona, California
24 CME*
This new course will cover the functional associations between the cranial nerves, the sutures, the dura, and the brain. By directly palpating the peripheral branches of cranial nerves, we can evaluate/palpate them for abnormal tension.

January 9-11, 2009
Fundamentals of OMM
Ft. Lauderdale, Florida
20 CME*
This course will review indications, contraindications, documentation and coding for osteopathic manual medicine; indications for treatment, approach to common conditions, integrating OMT into your clinical practice.

January 23-25, 2009
Fundamentals of OMM
Glendale, Arizona
20 CME*
This course will review indications, contraindications, documentation and coding for osteopathic manual medicine; indications for treatment, approach to common conditions, integrating OMT into your clinical practice.

February 28-March 1, 2009
Dr. Fulford's Basic Percussion: A Systematic Approach to the Whole Body
Tucson, Arizona
15 CME*
This level III course is based on the life work of Robert C. Fulford, DO in osteopathy, life energy, vibration, and the use of the percussion vibrator. This basic course explores these concepts using material that Dr. Fulford developed during his lifetime.

March 25, 2009
Progressive Inhibition of Neuromusculoskeletal Structures (PINS)
Little Rock, Arkansas
6 CME*
This level I course, developed by Dennis J. Dowling, DO, FAAO, is a system of diagnosis and treatment in which the osteopathic practitioner locates two related points and sequentially applies inhibitory pressure along a series of related points.

March 26-29, 2009
AAO Annual Convocation
Basic Mechanisms of Osteopathy: Balancing the Neuroendocrine Immune System
Little Rock, Arkansas
26.5 CME*
The annual Convocation will re-discover the role of science as a key to balancing physiological function through the use of osteopathic manipulative treatment.

March 29-31, 2009
Osteopathic Considerations in the Foregut with an Emphasis on Gastroesophageal Reflux Disease
Little Rock, Arkansas
20 CME*
This new level IV course will explore the foregut and its most common medical condition, gastroesophageal reflux disease (GERD).

May 1-3, 2009
Evidenced-Based Manual Medicine: A Problem Oriented Approach
Pomona, California
20 CME*
This is a level I didactic and hands-on laboratory course designed for the practicing clinician, educators or health professional students, who wish to better understand the evidence-based manual medicine approach to patients with musculoskeletal problems.

May 15-17, 2009
The Still Technique
Stratford, New Jersey
20 CME*
This level III course will cover the history of the Still Technique, its loss and recovery; identify the underlying method of the Still technique; learn segmented diagnostic techniques that are shared by this technique with HVLA and muscle energy technique as well as those unique to the Still technique.

For more information or to register for any of these programs, please visit:
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Dig On:

Muscle Impulse, A Muscle Energy Variant

Richard L. Van Buskirk

Quite unexpectedly, I have stumbled onto another new method for manipulating musculoskeletal restrictions or somatic dysfunctions. I was instrumental in the recovery and redevelopment of a manipulative method originally used by Andrew Taylor Still[14,15]. Therefore, it is with more than a little bemusement that I have once again come across a manipulative method that seems sufficiently different from others developed by our profession that I believe it deserves a new name.

The initial discovery of this seemingly new manipulative method came while treating the tensor fascia lata and iliotibial (IT) band. Although the Still Technique is quite powerful in treating a wide variety of tissue restrictions, it too is not always successful. One place where it sometimes fails to demonstrate efficacy is in treatment of the marked tenderness over the femoral greater trochanter. If the gluteal muscles and their tendons have been successfully treated and tenderness over the greater trochanter remains, I typically treat the tensor fascia lata and IT band using Still Technique. If that resolves the tenderness in the tensor fascia lata and IT band but the greater trochanter remains tender to palpation, I begin to entertain the possibility that it represents a trochanteric bursitis. Rather than jumping to conclusions, I typically will attempt to treat it with muscle energy or counterstrain. If that fails, I then conclude that a trochanteric bursitis is the source of the problem and treat the patient accordingly.

Unfortunately, the counterstrain position of ease for the tensor fascia lata and IT band (marked abduction of the leg at the hip) would sometimes cause tension and pain in the antagonist muscles, particularly adductor brevis and longus. One time, rather than stopping and treating these antagonists with Still Technique, I asked the patient to attempt to adduct the leg while I continued to hold the position of ease for the tensor fascia lata. In the past, I had simply followed the muscle energy formula, progressively abducting the leg three times after a voluntary adduction against resistance for 7 to 10 seconds. In this particular case, the patient was older and not in good shape. I knew from experience with her that she would have trouble sustaining any muscle action. I simply asked her to try to push with her leg briefly three times. She pushed for about a second three times and I did not try to further abduct the leg between pushes. Much to my surprise her pain in her adductors stopped and I was able to complete the counterstrain for the tensor fascia lata. When I evaluated her hip adductor muscles there was no evidence of somatic dysfunction.

Without thinking too much about it, I began to use this pulse technique whenever I was performing a Counterstrain maneuver and had to deal with pain in the patient's antagonist muscles. I did not realize that I was doing anything unusual until a student who was rotating in my office asked me about it. At that point, I began to look at it as a variant of muscle energy, and further evaluate its properties.

One thing that rapidly became apparent was that, like muscle energy, three successive activations of the muscles being treated were necessary and sufficient to produce a release. If I was using the technique as a muscle energy variant rather than as an adjunct to counterstrain, I would bring the affected tissue to its restriction and then hold it in place while the patient mounted three very brief impulses away from the barrier. Only after the third impulse I would then passively move the tissue through where the barrier had been. Typically the amount of release past the restriction was similar to the result if the patient had produced three prolonged isometric activations followed each time by the operator moving the tissue toward the "new barrier". Similar to muscle energy the new technique would fully resolve any and all signs and symptoms of somatic dysfunction (asymmetry of presentation and range of motion, tissue texture changes, and tenderness if present).

I began to show this new variation of the muscle energy technique. The physicians and students who saw it and tried it felt it was enough different that it deserved its own name. Therefore, I have taken to calling it muscle impulse. At this point I do not know if others have also found this variant. However I can find no reference to it.

In some ways muscle impulse is similar to T. J. Ruddy's "rapid resistive duction" technique[12]. This early manipulative method is considered a precursor to the muscle energy technique developed by Fred Mitchell, Sr., DO[11]. However, Ruddy's technique involved holding a tight muscle at its' restrictive barrier and having the patient (or the operator if the patient was unable to cooperate) mount a series of very rapid miniature contractions toward the barrier at the basal heart rate (up to 20 contractions at 60 per minute) while holding the tissue rigidly in place. The method was focused on strengthening a muscle rather than removing restrictions.

As it is currently conceived, muscle impulse follows the following protocol:

- Identify the tissue showing signs of somatic dysfunction. Like muscle energy (and as well counterstrain and Still technique) the technique can treat a wide variety of tissues including muscles and tendons, ligaments, joints, and vertebrae[3,3,4,10,11].
- Identify the tissue restriction. The more accurate the delineation of the "barrier" the better the results. In this regard, it is very similar to both muscle energy and high velocity low amplitude (HVLA).[3,7,8,9,10,11,16]
- Bring the tissue to its restriction and hold it in place.
- Have the patient produce three very brief attempts to move the tissue towards its ease (away from the restriction). I typically give the instructions "Push, Stop, Push, Stop, Push, Stop" as fast as I can say them. This does not allow the development of any real muscle force. Ideally the tissue should be monitored to ensure that the patient is in fact making an isometric impulse.
- As soon as the patient has made the last isometric impulse the physician carries the tissue passively through the area of prior restriction. As in muscle energy, HVLA

and Still technique there is no sense of remaining barrier and the tissue shows its full normal range of motion.

Muscle Impulse differs from muscle energy in several important details:

- Muscle energy takes approximately 35 seconds to execute per tissue treated according to the original protocol.[3,10,11] I have heard others discuss doing the isometric activation for less than 10 seconds per activation, but never for as brief a period as that used in muscle impulse (approximately one second). Thus, the whole treatment of a restricted tissue in muscle impulse takes no more than four seconds.
- Muscle energy has the operator move the tissue into the barrier after each isometric activation.[3,10,11] Muscle impulse holds the tissue rigidly at the original restriction until all three impulses are finished, then moves the tissue through what had been the restriction.
- Muscle energy requires the operator to carefully try to get the patient to use as little force as possible during the isometric phase.[3,10,11] Often this is a losing battle and the patient actually moves the tissue non-isometrically to at least some degree. This also puts some strain on the operator to try to hold the tissue in place. Muscle Impulse involves such a brief activation of the muscle that only minimal force is actually generated by the patient. In this regard it is more similar to the opto-kinetic activation sometimes utilized in the cervical spine. There is no strain on the operator.

As with most osteopathic manipulative methods there is no easily defined mechanism of action. In part of course that is because there is no rigorously tested hypothesis as to the generation or maintenance of the somatic dysfunction. Lacking that, there are many hypotheses both as to the causes of somatic dysfunction and the mechanism of action of manipulative methods in relieving somatic dysfunction. I tend to lean toward an integrated mechanism that includes both neural elements and fascial elements[13,15] as does Fred Mitchell Jr., DO[10], although most texts delineating putative mechanisms underlying Muscle Energy tend to focus on neural mechanisms to the extent they discuss mechanisms at all[3,8,11]. Clearly the rapidity with which resolution occurs points to at least a partially neural mechanism, whether involving the nociceptor[13,15] or muscle spindle.[1,2,5,6]

References:

1. Denslow JS, and Hassett. The central excitatory state associated with postural abnormalities. *J. Neurophysiol,* 5 (1944). 393-402.
2. Denslow JS, Korr IM, and Krems AD. Quantitative studies of chronic facilitation in human motoneuron pool. *Am J Physiol*, 105 (1947). 229-38.
3. Greenman PE. *Principles of Manual Medicine. Third Edition*. Lippincott Williams & Wilkins, Baltimore. 2003.
4. Jones LH. *Strain & Counterstrain*. American Academy of Osteopathy, Newark, OH. 1981.
5. Korr IM. The neural basis of the osteopathic lesion. *JAOA*, 47 (1947). 191-198.
6. Korr IM. Proprioceptors and somatic dysfunction. *JAOA*, 75 (1975). 638-650.
7. Kappler RE. and Jones JM. Thrust (High-Velocity Low-Amplitude). In: Robert C. Ward (ed.), *Foundations for Osteopathic Medicine, 2nd Edition*. Lippincott Williams & Wilkins, Philadelphia, PA 20030. 852-880.
8. Kuchera M and Kuchera WM. *Osteopathic Principles in Practice, 2nd Edition*, KCOM Press, Kirksville, MO. 1991.
9. McConnell CP. *The Practice of Osteopathy, 2nd Edition*. The Hammond Press, 1900.
10. Mitchell Fred L. Jr., and Mitchell, P.K.G. *The Muscle Energy Manual*, Vols. 1,2,3, MET Press, East Lansing, MI, 1995.
11. Mitchell Fred L. Jr., Moran, P.S., and Pruzzo, N.A. *An Evaluation and Treatment Manual of Osteopathic Muscle Energy Procedures*. Mitchell, Moran, and Pruzzo, Associates, Valley Park, MO, 1979.
12. Ruddy TJ. Osteopathic rapid rhythmic resistive technic. *Academy of Applied Osteopathy Yearbook, 1962*, 23-31.
13. Van Buskirk RL. Nocioceptive reflexes and the somatic dysfunction: a model. *JAOA*, 90 (1990), 792-809.
14. Van Buskirk RL. A manipulative technique of Andrew Taylor Still *JAOA*, 96 (1996), 597-602.
15. Van Buskirk RL. *Still Technique Manual, Applications of a Rediscovered Technique of Dr. Andrew Taylor Still*, Second Edition. American Academy of Osteopathy, Indianapolis, IN, 2007.
16. Walton WJ. *Textbook of Osteopathic Diagnosis and Technique Procedures*. The American Academy of Osteopathy, Newark, OH, 1972.

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CME QUIZ

The purpose of the quiz found on page 32 is to provide a convenient means of self-assessment for your reading of the scientific content in the "Muscle Impulse, A Muscle Energy Variant" by Richard L. Van Buskirk, DO, PhD, FAAO.
Answer each of the questions listed. The correct answers will be published in the March 2009 issue of *The AAOJ*.

To apply for Category 2 -B CME credit, transfer your answers to the AAOJ CME Quiz Application Form answer sheet on page 32 The AAO will record the fact that you submitted the form for Category 2 -B CME credit and will forward your test results to the AOA Division of CME for documentation. You must have a 70% accuracy to order to receive CME credits.

2008 Northup Lecture

Contemplations on the Art of OMT After Thirty Years of Practice

Karen M. Steele

For a few moments today, I would like to talk a bit about the art of osteopathic manipulative treatment, OMT, osteopathy, or traditional osteopathy, as you may call it. I have chosen to explore those attributes within ourselves which we must bring to the patient interaction when providing OMT to our patients. And, I have chosen to use the metaphor of the art of pottery in this treatise, as I am a novice potter and still easily fall into the "beginners mind" of this art. Both osteopathy and pottery deal with dirt and the divine, and either can be a metaphor for the other. I learned osteopathy first and much later became a novice potter. The lessons I have learned and gifts I have received from osteopathy that I would like to ponder today are summed up by the following phrases:

Do not expect to be good for a really, really, long time.
Center yourself first.
When is enough, enough?
Do your work, and then step back.

Do not expect to be good for a really, really long time.

I have always felt like I was sculpting when doing OMT, starting with a vision of the underlying anatomy as I would try to gracefully, purposely, and firmly move the tissues and energies under my hands, leading the body toward a more functional balance. So it seems natural that I would eventually want to try working with clay. I had not thrown very many pots before my teacher began encouraging me to buy my own pottery wheel and kiln. I had been renting space and time in her studio, so this recommendation would not have come from a perspective of financial gain. I would throw a few tiny pots which she would include with other tiny pots into a student bisque firing. I would then apply the glazes to my tiny pots and she would put them through a second student firing. The resultant tiny pots brought me great joy.... for a while. Then I wanted to explore with other clays and other glazes. The results were less predictable, and sometimes catastrophic. I learned why she put student work in a firing separate from her professional work – uneven pots explode in the kiln when the heat is absorbed differentially across uneven pot walls! And any pieces on that same shelf are in jeopardy of being shattered from flying shrapnel. I learned that glazes applied too thickly run and then fuse to the kiln shelf. I learned that red glazes make everything else in the kiln red, and that glazes which are not a good match for the clay pit, leaving unglazed areas which make the pot unsafe for using with food.

After I had the awful experience of a whole shelf of my work explode because I could not make the hard decision to discard a faulty piece, and went ahead and fired it with other pieces in my kiln, she said to me "Now you are truly a potter"! After I had the soft red terra cotta clay melt and fuse to the kiln shelf because I would fired it at Cone 6 rather than Cone 06, it altered my respect for the characteristics of the clay body. And it reminded me of the power of logarithmic tables. Now, when I look at a pot, I "see" with more than just my eyes. I see the beauty of the clay and glazes which have been selected to form a functional and beautiful piece. I also know the strength of the clay that has been used; I see the lines of the potter's fingertips making the swirl in the bottom of the bowl; I know if the glaze chosen was well suited to the clay body of the piece; and I appreciate the asymmetries that make this piece unique and handmade rather than poured and casted. And I am still very much a beginner in the art of pottery.

Is it not the same for the practice of osteopathy, after we have been at it a while? We evaluate a patient and we can see what the end result will likely be, with and without our treatment. We do not really know how we know, be we know there is a short leg, or emotional trauma underlying the patient's symptom. We can sense the age of our patient when they incurred the contributing trauma or illness. Some of us can see damaged internal tissue, or sense vibration aberrations in the patient. Based on our cognitive and intuitive knowledge, we envision what we believe could be the desired end result – a child who can efficiently coordinate their suck and swallow mechanism; a teenager who can run without knee pain; better respiratory status in a midlife adult hospitalized with pneumonia; or peace in an elder facing end of life issues. We then formulate a treatment plan, knowing that we will reevaluate at every visit, and we will be willing to allow the status of the patient at follow up to alter our original plan. We learn how to "dose" our osteopathic manipulative treatments, through lessons from our teachers – those more experienced in this skill, and our patient teachers, who are the stricter of the two. Early in my osteopathic practice, I had an elder return to me with greater pain after a vigorous treatment to a frail body. I then really knew that older bodies need gentler handling. I had over treated her and put her to bed for a few days. Fifteen years later, after many more lessons learned about dosing OMT, I discussed the manipulative prescription concept in detail in my chapter "Treatment of the Acutely Ill Hospitalized Patient" in the first edition of *Foundations for Osteopathic Medicine*[1]. I saw a woman in her early 40's for recurrent headaches, whose medical work up was benign. I finally thought to have her stand up and performed a postural examination. I found a significant postural strain which, when addressed, provided relief in her symptoms. Early in my career, I had children improve in their middle ear functioning after 8 or 10 treatments, for which the parents and I were delighted. Then I learned the secret of the diaphragm in children's problem, and when I began to routinely access and treat the diaphragm, the children got better much more quickly. Now I have learned to trust my "intuition" that there is "something" at a given level of my patient's being, a problem of "mind, matter or motion".[2]

There is a saying that smooth seas never made a great mariner. We do not become a master in traditional osteopathy from reading books, or from listening to our wise elders. We must "go to sea" and really experience the dance of healing with our patients, and then follow up and see how their body responded. It is that feedback over time from many patient interactions which hones our skills. I remember Dr. John Harakal at a Faculty Development Seminar sponsored by the Sutherland Cranial Teaching Foundation expressing alarm and distress that there were young osteopathic practitioners who were teaching cranial osteopathy with only five years of experience. He thought it was preposterous! We must have experience before we can anticipate the end. Hence my teacher's exclamation "Now you are a true potter" when all my pots on one shelf were shattered. It was more than just disappointment that I had lost a few pots. The time making those pots had not been wasted because I had increased my skill by making them. It was the visceral reaction in me because I had been told this could happen, I knew better, and I did it anyway. After that experience I <u>really</u> knew to carefully select which pots go on to be fired.

It takes 60 months to obtain 5 years of experience, which for most skills, is a minimum amount of time to become competent – not highly skilled, just competent. Anticipating the end is the gestalt of experience that a seasoned osteopathic practitioner brings to every patient interaction. I remember Dr. Robert Fulford remarking late in his life, that he was amazed at what he had learned in the previous few years. The better we can predict the end and the paths our patients will likely follow to get there, the more efficiently we can help guide them toward health.

Center yourself first

Everyone knows that in the art of pottery, centering is the hardest part. Centering is at the center of pottery – and of osteopathy. But what is centering? And how do we learn to center ourselves? We learn from our wise ones, and from our patients, while we keep trying – forever. I have learned in pottery to wedge the clay well; form it into approximately the shape I want this pot to take; start the wheel; and then sit and wait. I feel the clay in my hands; watch and feel the wheel in its hypnotizing rhythm; raise my arms; and only when my whole being is focused on making the clay sit at the center of the spinning wheel do I forcefully throw the clay onto the wheel. It is the same with an interaction with a patient. We enter the room and begin interviewing the patient, at first nonverbally, and then with our questions. We decide if OMT would likely be beneficial to that patient, and if so, we obtain their consent. Then we center ourselves, and align ourselves with our patient. When there is nothing else in our mind except that patient's body/mind/spirit, and how we will enter into a dance of healing with them, then we begin our treatment.

I learned from the potter's wheel a new found respect for the intentional decision to become focused on the task at hand, and let nothing else enter my thoughts. I learned to concentrate only on the speed of the wheel, the wetness and consistency of the clay, and the position of my hands in relation to the clay. I remember noticing the tension in my triceps muscle, as I learned to pull the clay toward me, and against the centrifugal force of the wheel. I have utilized this same concept when doing OMT, where I am not just pushing or pulling a bone or fascial band, but balancing that body from within, allowing it to function more fully, gracefully, and comfortably. I have found this skill to be crucial in being able to treat the "rich and famous". I remember my first time I treated my then Department Chairperson, Dr. Mike Kuchera, when I was a resident. I was so nervous that I was shaking, even though I had known him for a long time, as we had graduated only a year apart from KCOM a little more than 10 years prior, and his wife and I had been friends before I ever even met Dr. Mike. What he received was an articulatory treatment! Now I am much better able to simply interact with the center of the being on my table. I am not tied to the outcome – only to doing my best for that treatment. I can treat the wealthy, or famous, or everyday person with the same level of intent and skill. I am freed from feeling that those who travel hours or days to come to me for treatment deserve <u>more</u>. What they deserve is my best, which is not necessarily more. I am freed from ego-centric caring what the outcome of "my" treatment will be. So I do not feel the pressure of "proving" osteopathy to a skeptic who is giving it a try. All I have control over is what I bring to that interaction, and the patient then does with it what he or she will. It is freeing, to be centered. But it is not necessarily easy or automatic. Surely, it is much easier and automatic with practice, but I find it still requires intention on a regular basis.

And where does this centering come from? Again, taking the metaphor of throwing a clay pot, after I had learned to throw the clay into the center of the spinning wheel, then came the centering. I was using much hand strength to mould the clay, while pulling it toward me so it would not spin off the wheel. My hands got very tired, but my lumps of clay were still not centered. When I would open them, they were lopsided. They would not be pots I would put into a kiln to fire – as I learned the hard way. So, they were thrown into the clay recycling bucket, and I would try centering another pot. I remember the "aha!" moment when I finally really understood where the strength comes from in centering. And it was not that I needed more hand strength. It was strength from my core being – from my solar plexus. I learned this when my teacher put her hands over mine on my small wedge of clay, and centered my clay through my hands. She certainly had strength in her hands, but her hand muscles were gentle. Her strength was a tension in every muscle and tendon in her arms, and shoulders, and upper back, strengthened by her abdomen and lower back and the very center of her being. I <u>got</u> it. "What you need to do pottery is hand strength and concentration", my teacher said when I first began pottery lessons. That was the "concentration" part she was talking about! And I use that same lesson with my patients, of centering myself before I ever begin to treat a patient, from the very center of my being, and with my whole being.

I have long felt that the reason those DOs who regularly practice "traditional osteopathy", as the Canadians call it, are youthful in mind and spirit even into their advanced years, is because they learned the art of being in the moment, fully concentrating on the body/mind/spirit of the person on their table. I have diligently worked to achieve this skill in my osteopathic practice over the past three decades, and I still have a ways to go. Whenever my mind wanders during the treatment, my results are less optimal. Whenever my mind wanders, the child under my hands begins fussing or acting out, clearly reminding me to refocus on them. I believe the skill we develop centering ourselves, and being totally concentrated in the moment is a gift we receive from our work, and the more we are able to be totally in the moment with our patient, the more refreshed our spirit becomes. We may go home tired physically, but mentally and spiritually we have been replenished from being still and meditative with our patients throughout the day.

When is enough, enough?

My pottery teacher asked me "How long does it take to make a good pot?" The answer was "As long as it takes." She then asked "When is enough, enough"? At that point, she gave a little shove against my hand which was opening up a pot, and simply smiled and walked away, commenting that she was confident I could straighten it out. These are good questions to ponder in the practice of traditional osteopathy as well.

Is the end point for the treatment session when the 15, 30 or 60 minutes are up; or when we have treated from head to toe; or when the patient's symptom is improved; or when we feel the patient has had the intervention they need for their body to work with over the next few days or weeks? Do we use the 12 or 20 treatments allowed by the patient's insurance company as determiner of treatment end point? Or are we done when the functionality desired by the patient or parent has been achieved? I remember table training a young osteopathic physician during a seminar. He was unsuccessful in the technique he had provided to his partner. When I asked what he would do from here, he answered that he had administered the technique correctly, and there was nothing else to do. Someday, he will know that administering a technique properly and administering an effective treatment are worlds apart. But, again, that comes from years of experience.

For me, I know I am close to done for that visit or problem when I can feel the cranial rhythmic impulse (CRI) rush into the area of least vitality. I have also learned that when I do feel the CRI in that area, I am done. Or at least should be done! My toughest osteopathic teachers, my patients, have shown me that when I continue the treatment because I have more things I would like to treat; I undo much of what has just occurred in that interaction. It feels to me as if the patient's being is pushing me away with the CRI, in essence saying "You are done; now it is my turn."

"Do your work, and then step back."

I have learned that I am not always aware when a healing event has occurred. I remember the first time when I became aware of the fact that I may be helping someone even when I am not feeling at my best, or have not had an awareness they were significantly changed. I was conducting a demonstration of lumbar myofascial release for a group of 3rd year osteopathic medical students soon after completion of my neuromusculoskeletal medicine/osteopathic manipulative medicine residency. For no particular reason, which I now know was from intuitive knowledge, I placed one hand on the lumbar area and my other hand on the mid-thoracic area of the student who had volunteered to be the model, to complement the unwinding. Many months later that student told me how much that simple treatment had helped him with a chronic problem. It was my impression that nothing of significance had occurred. And so I have learned the same lesson over and over. There are days when I feel as inept as I did the first time I did an osteopathic manipulative medicine consult in the hospital, when I feel as if I have not been helpful to anyone whom I have treated that day. But I have also learned that my judgment of whether that treatment was helpful or not is not what really matters anyway. It is the patient's opinion of that treatment which matters.

And so I continue each day, centering myself before I begin with each patient; clearing my mind so my entire being is concentrating only on that patient; knowing that I have really only begun on the path to mastery in my chosen field; letting the patient's body tell me when enough is enough; and doing my work, then stepping back. At that moment, my job is done.

I thank you for your kind attention to my discourse on osteopathy today. I would like to thank my pottery teacher, Ms. Diana Hunt, who taught me about more than just playing in the dirt, and my patients, who have taught me everything I truly know about osteopathy.

References

1. Steele KM. Treatment of the Acutely Ill Hospitalized Patient. In Ward RC Ed. *Foundations for Osteopathic Medicine*. 1997. 1037-1048.
2. Still AT. *Autobiography of Andrew T. Still*. Kirksville, MO. 1908. 149.

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Retrospective Study of a Peer Assessment Education Encounter in the Development of Osteopathic Clinical Skills

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Abstract

Background
Because primary care physicians see a large number of patients with musculoskeletal problems, osteopathic clinical skills are important for successful patient care. We have incorporated a peer assessment of osteopathic medical students dubbed a "real patient encounter" or "RPE" as an educational exercise. A real patient encounter (where students carry out selected aspects of medical history taking, physical examination, differential diagnosis, treatment, and evidence-based medicine) performed by second year osteopathic medical students using first year medical students as patients was studied to determine if the encounter has benefit in developing osteopathic clinical skills.

Methods
First and second year osteopathic medical students at A.T. Still University - Kirksville College of Osteopathic Medicine participated in a pseudo patient-physician exercise, dubbed real patient encounter, for the Osteopathic Theory and Methods course in the spring quarter of 2006. Osteopathic medical students were evaluated and treated with osteopathic manipulation to evaluate levels of skill and provide a peer assessment and feedback. The first year students presented as patients with mostly self-selected musculoskeletal and/or related organ system medical problems for evaluation and osteopathic treatment by the second year students. Second year student doctors documented areas of somatic dysfunction and pain levels experienced by the first year student patients before administering osteopathic treatment. For extra credit, the first year students completed a post-encounter electronic questionnaire evaluating second year student performance. Percentages were calculated to assess the data.

Results
Second year medical students identified 3.9±1.1 (mean±SD) different regions of somatic dysfunction with a range of 1 to 7 body regions out of 9 reported with somatic dysfunction in individual first year students. Using a standard, 11-point analog pain scale, first year students reported a level of pain of 2.7±1.8, with levels ranging from 0 to 8. Using a standard Likert scale to rate the care given by the second year students, first year students reported satisfaction ranging from 71% to 97% in various categories.

Conclusions
Results seem to indicate that peer encounters called RPEs are valid academic exercises that are well received by student patients and doctors, thereby validating the osteopathic clinical skills taught at colleges of osteopathic medicine.

Background

It is sometimes argued that osteopathic medical students do not have access to a sufficient number of clinic patients during the first two years of training and, therefore, fail to gain the medical experience, basic problem solving skills, and pattern recognition necessary for the successful development of primary care skills. While multiple educational modalities exist to teach osteopathic clinical skills and to build autonomous learning skills, all teaching tools have intrinsic limitations and do not adequately develop all necessary physician level skills. For instance, problem-based learning and the case-based format provide increments of improvement only in certain skill sets, such as understanding the nature of a diagnosis or clinical presentation by a complex example.[1, 2] The development and use of computerized interactive educational formats are valuable, especially for developing differential diagnosis skills. The almost universal tool of the standardized patient represents a uniform methodology for ascertaining minimal competence in certain arenas and has been shown to be reliable and useful in the development of physician behaviors.[3] The standardized patient format has been adopted by the National Board of Osteopathic Medical Examiners (NBOME) as one of the testing formats for assessment of osteopathic physicians. When coupled with self-assessment, the feedback from the standardized patient process can provide an objective method for application of certain ascertainable standards.[3]

However, while standardized patient encounters offer students opportunities for the development of osteopathic clinical skills, they primarily assess the process (correct diagnosis and development of patient interaction skills) rather than the specific outcome required for successful intervention (correct diagnosis and treatment of the patient performed in a professional manner). For that reason, one could argue that standardized patient encounters advance education in Bloom's hierarchy of the cognitive domain[4] to the "application" level. Bloom's application level denotes a successful process rather than a successful or meaningful outcome. Because the same standardized patient is used for multiple procedures, a given standardized patient encounter lacks the necessary component of a patient-unique, outcome-driven modality. By definition, standardized patients are expected to be uniform in their hypothetical pseudophysical examination responses, laboratory values, and formulated history. The special, testable encounter lacks patient-unique variability as the same standardized patient presenting the same disease process is used for each student physician. Additionally, standardized patients cannot be used to assess a student's osteopathic clinical skills. Standardized patients "simulate" certain disease states with predictable patterns of somatic dysfunction associated with organ system problems: the student physician is evaluated on the correct palpatory location of dysfunction rather than determining the areas of dysfunction, but each individual is unique. Another drawback for the use of standardized patients in

the development of osteopathic clinical skills is that standardized patients cannot be subjected to all modes of osteopathic treatment (especially direct action high-velocity, low-amplitude thrusting techniques) from different student physicians. Since the development of osteopathic clinical skills requires the practice of osteopathic manipulative techniques, new standardized patients would be required for multiple encounters.

Students are given the opportunity to improve their clinical skills in their osteopathic skills laboratories, where they evaluate and treat their fellow classmates. However, these encounters may not be considered by the students as representative of actual patient encounters or as a means of advancing clinical skills. Other means are required for convincing students that their fellow classmates are valuable and convenient resources for developing clinical skills. Thus, the formality and realism of the standardized patient encounter can be combined with the treatment of fellow classmates to create a "real patient encounter" (RPE). RPEs involve students performing selected aspects of medical history taking, physical examination, differential diagnosis, treatment, and evidence-based medicine. The expectations of the exercise include real (not contrived or scripted) patient-identified problems mandating relevant history to be recorded in the Subjective section of a SOAP note, accurate physical examination findings to be recorded in the Objective section, diagnostic conclusions to be recorded in the clinical Assessment section, and a coherent treatment program to be recorded in the Plan section. While the setting is educational, the encounter promotes desired physician skill and treatment components. The RPE also provides management of clinical skills development in an observed educational setting among a patient population with actual medical issues and, therefore, can provide educators with additional information on skill set development which is not possible in standardized patient encounters.[3]

To verify that this educational tool is beneficial for the development of osteopathic clinical skills, the RPE for the Osteopathic Theory and Methods course at A.T. Still University - Kirksville College of Osteopathic Medicine (ATSU-KCOM) in the spring quarter of 2006 was analyzed where second year students were the physician and first year students were the patient. An extra credit post-encounter electronic questionnaire was completed by the first year students to ascertain levels of satisfaction with the second year students' performance.

Methods

The local institutional review board (IRB) reviewed this proposed retrospective study. As all identifying information was changed to protect anonymity and students were not required to divulge medical history items they felt were sensitive, IRB exemption was granted.

Two RPEs are part of the assigned coursework for Osteopathic Theory and Methods; data for this study was obtained from the second RPE from the course. All RPEs are observed by an ATSU-KCOM faculty member (supervising physician) from the Department of Osteopathic Manipulative Medicine and take place during scheduled class laboratory periods. During this RPE, the second year medical students who performed in the role of physician were provided a review of the patient history in a modified COPMAP (chief complaint, onset, progression, modifying factors, associated symptoms, and previous occurrences) format. This COPMAP was used for completing the HPI (history of present illness) portion of the medical history. Included in the history form were an analog pain scale, front and back pain diagrams, and a review of systems. The first year student patients indicated only those current medical problems (mostly musculoskeletal in nature) they felt comfortable divulging. It was possible for a student patient to list no current complaints. The second year medical students focused on the primary complaint of the patient with the expectation that the osteopathic neuromusculoskeletal examination would be integrated. They were also expected to identify and address any particular problems reported by the patient with respect to visceral disease. Somatic dysfunction regions analyzed were the head, cervical, thoracic, lumbar, ribs, pelvis, sacrum, upper extremities, and lower extremities. Designation of areas identified with somatic dysfunction typically includes two or more of four criteria: 1) local tissue responses and texture changes, such as temperature, sudomotor activity, confluent rubbery texture, and segmental muscle hypertonicity; 2) local hyperalgesia; 3) altered end motor range and end point barrier feel; and 4) asymmetry of anatomic structures. Organ system complaints analyzed by region were the head and neck, cardiovascular, respiratory, gastrointestinal, genitourinary, endocrine, skin, musculoskeletal, and neurological. Before the appropriate osteopathic medical treatment was administered by the student, the student physicians' findings were confirmed by the supervising physician. At any time during the encounter, the supervising physician could interrupt the encounter and address clinical deficiencies of the student physician, but they were also available to answer questions and provide help when requested to do so by the student.

In general, the second year students were free to choose the osteopathic treatment modalities they felt would be most advantageous for their patients, but that were also consistent with their individual skill set development. Proposed treatment methods were only modified if the patient had an underlying condition or specific reason for requiring a particular technique or methodology. After completing the osteopathic treatment component, the supervising physician reevaluated and critiqued the treatment phase of the encounter so that the student physician had immediate feedback for improving their clinical skills. During this stage, the faculty member might direct the student physician to further treat an area considered to have remaining somatic dysfunction. Occasionally, the faculty member, rather than the student, corrected the remaining somatic dysfunction to reinforce positive treatment effects and provide additional instruction on an individual basis. An effort was made not to undermine the confidence of the student physician.

The second year student physician ended the encounter by providing the first year student patient further treatment suggestions, information on lifestyle modifications, instructions on stretching techniques, and follow-up patient care. The final course requirement for the second year student was to write a progress note using the SOAP (subjective, objective, assessment, plan) format. The SOAP note was analyzed for information regarding identified somatic dysfunction by region, patient complaints by body region and organ system, and reported level of pain to determine if the student physician could correctly identify areas of dysfunction and as a means of evaluating the development of their osteopathic clinical skills. Means and standard deviations were calculated for these three variables.

Using a standard Likert scale, an extra credit, voluntary, elec-

tronic post-encounter survey consisting of 20 questions in seven categories with additional space for written comments was completed by the first year students. A list of the questions comprising the online survey is appended to this manuscript as an additional file. Students provided their name to receive the extra credit, but the survey tool did not correlate respondent name with actual responses, thus preserving anonymity. On the survey, students indicated how strongly they agreed or disagreed with questions concerning the second year student physician's performance in the seven categories of osteopathic manipulative medicine, general medical knowledge, interpersonal and communication skills, patient care, patient education, professionalism, and overall performance. Some of the questions specifically addressed patient comfort, treating areas of complaint, treatment of associated areas, overall organization, and the integration of osteopathic findings with the history and physical examination. For the purposes of data analysis, the questions that students marked as "strongly agree" or "agree" were combined into one category. Questions marked as "disagree" and "strongly disagree" were also combined into one category. Additionally, data analysis included a neutral category.

Data was collected on the number of participants and their ages. Percentages were calculated based on specific number of responses and total sample size.

Results

One hundred and sixty-six first year osteopathic medical students and 173 second year osteopathic medical students participated in the RPE. Due to unequal numbers of students, some first year students were treated twice (although non-student volunteer patients were recruited when possible). Four first year students' data were excluded from subsequent analyses because of incomplete data acquisition, leaving a cohort of 162 student patients. Participants were aged 20 to 37 years.

Student Physician Findings

Analysis of the second year medical students' SOAP notes identified 3.9±1.1 (mean±SD) different regions of somatic dysfunction for the first year student patients with a range of 1 to 7 body regions out of 9 reported with somatic dysfunction. For each patient, since more than one region could be diagnosed with somatic dysfunction, second year students could possibly diagnose somatic dysfunctions in each of the 10 body regions, causing the total percentage of the measured data for all regions to be greater than 100% (percentages are calculated per region). Figure 1 shows of the 162 patients, 70 (43%) had somatic dysfunction in the head region, 109 (67%) in the cervical, 140 (86%) in the thoracic, 77 (48%) in the lumbar, 67 (41%) in the ribs, 63 (39%) in the pelvis, 44 (27%) in the sacrum, 27 (17%) in the upper extremities, and 41 (25%) in the lower extremities.

Further analysis of the second year students' SOAP notes yielded a total number of areas of somatic dysfunction among the student patients. Figure 2 reveals of the possible 9 areas of somatic dysfunction evaluated, <1% out of 162 patients (1) had only 1 area of somatic dysfunction, 9 (6%) had 2 areas of dysfunction, 49 (30%) had 3 areas of dysfunction, 58 (36%) had 4 areas of dysfunction, 33 (20%) had 5 areas of dysfunction, 9 (6%) had 6 areas of dysfunction, and 3 (2%) had 7 areas of dysfunction. No patients had 0, 8, or 9 areas of dysfunction.

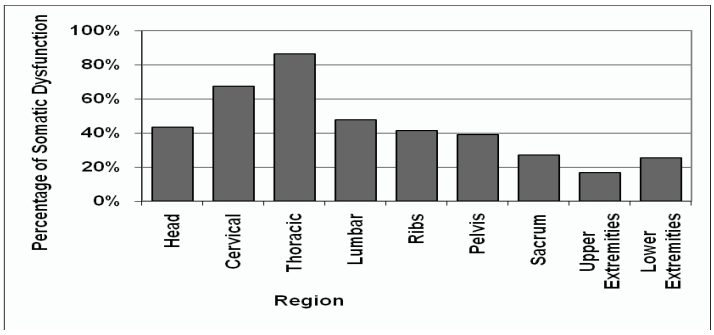

Figure 1 -
Percentage of Diagnosed Somatic Dysfunction by Region (n=162)

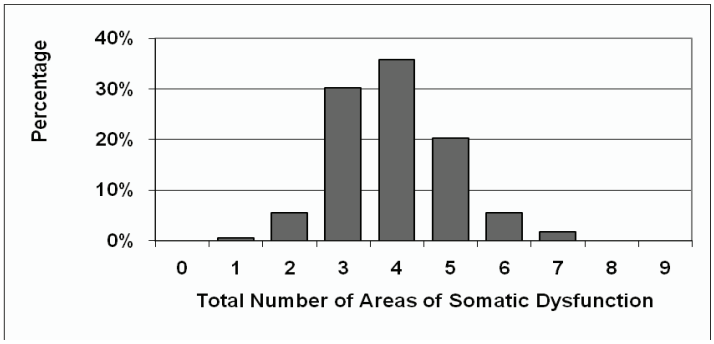

Figure 2 - Percentage of Total Number of Areas of Somatic Dysfunction in Student Patients (n=162)

The first year students reported their self-selected areas of complaint (mostly musculoskeletal) by body region and organ system. For each patient, more than one body region and organ system could be a source of complaint so that the total percentage of the measured data for all regions and organ systems could be greater than 100% (percentages are calculated per body region/organ system). Shown in Figure 3, of the 162 student patients, 68 (42%) complained of head and neck pain, 1 (<1%) of cardiovascular pain, 10 (6%) of respiratory pain, 5 (3%) of gastrointestinal pain, 1 (<1%) of skin pain, and 32 (20%) of neurological pain. Although included as possible sources of complaint, there were no reported complaints of genitourinary or endocrine pain. One hundred and fifty-eight (98%) of the student patients had a complaint of musculoskeletal pain which when combined with complaints in other organ systems show a large number of untreated or under treated medical issues in this population.

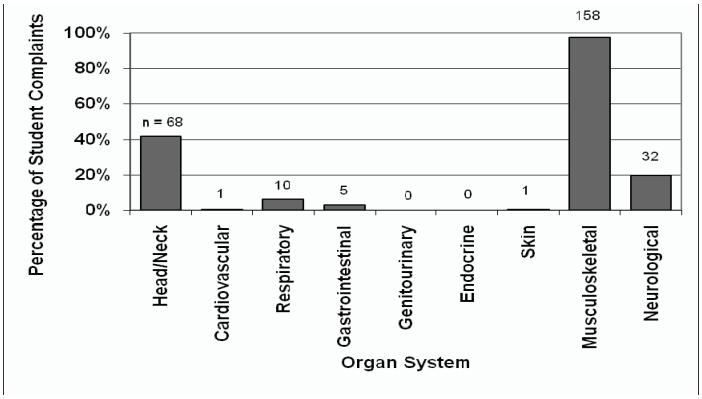

Figure 3 - Percentage of Number of Self-Reported Student Patient Complaints by Body Region and Organ Systems (n=162)

Self-reported pain levels of the first year students prior to examination were quantified on a standard 11-point analog pain scale. Figure 4 shows of the 162 students only 134 recorded a pain score. Those first year students reported 2.7±1.8 level of pain with reported pain levels ranging from 0 to 8. Further, 13 (10%) reported a score of 0 or no pain, 22 (16%) a pain score of 1, 35 (26%) a pain score of 2, 28 (21%) a pain score of 3, 14 (10%) a pain score of 4, 11 (8%) a pain score of 5, 6 (4%) a pain score of 6, 3 (2%) a pain score of 7, and 2 (<2%) a pain score of 8. There were no reported pain scores of 9 or 10.

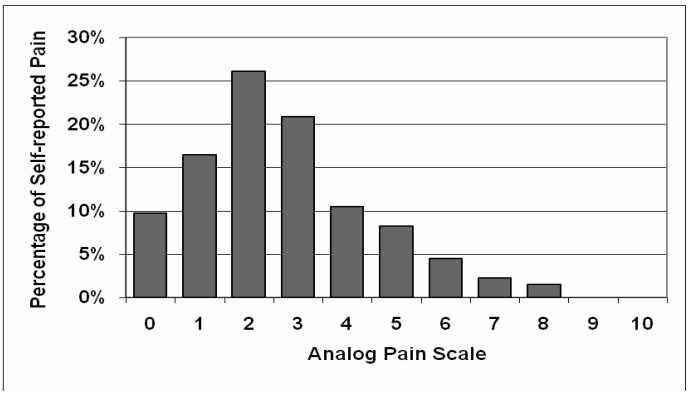

Figure 4 - Percentage of Self-reported Pain of Student Patients on a Standard Analog Pain Scale (n=134)

Post-encounter Survey

Of the 166 first year student participants of the RPE, 162 had complete data and 142 (86%) responded to the post-encounter survey for extra credit. Ninety-two of those students (65%) added written comments to their post-encounter survey. A few sample comments are included in this section to provide examples of the first year student patients' peer evaluations. Since this was a survey, there was a combination of subjective and objective responses. For example, under professionalism, objective items included "arrives on time" and "wore his/her lab coat" while subjective items included "took adequate time with history and physical examination" and "overall cleanliness." Responses were obtained for 99% of all questions in the seven categories relating to osteopathic manipulative medicine, general medical knowledge, interpersonal and communication skills, patient care, patient education, professionalism, and overall performance. Favorable student responses in all categories ranged from 71% to 97% with some variability from 1% to 23% in the neutral component. The unfavorable responses ranged from 2% to 6%.

The osteopathic manipulative medicine category had the lowest satisfaction (71%) and highest neutral response (23%) of the entire survey for the question relating to whether or not the student physician resolved the patient's current somatic dysfunction. One student wrote that they marked a neutral response for this question because "my pain is chronic" and is not easily resolved by treatment. A couple more students also qualified their written comments in relation to a chronic medical condition. Negative comments addressing the second year students' osteopathic clinical skills primarily addressed student doctor lack of confidence: "The student doctor did not seem to be comfortable or knowledgeable about all of the techniques that needed to be done in order to treat my problems." However, a few first year students specifically stated that the student physicians asked for help from the supervising physician, which enabled the student to successfully treat the patient. Finally, a few students wrote that the student physicians found more somatic dysfunction than expected as illustrated by one student who wrote, "She did a very good job and found much more dysfunction than I thought I had".

Discussion

We acknowledge there are intrinsic limitations of this exercise and notable problems of bias, including incomplete medical history, knowledge that the encounter was primarily educational rather than medical care, non-selection of a personal physician, and knowledge of level of knowledge of the student physicians. Despite this, results of this study seem to indicate that RPEs do have benefit in developing the osteopathic clinical skills of osteopathic medical students. Second year student physicians were able to identify areas of somatic dysfunction in the first year student patients. In some instances, the student physicians identified more areas of dysfunction than expected by the first year students. Notably, the second year students reported a large percentage of first year students with somatic dysfunction of the cervical (67%) and thoracic (86%) spine, which may reflect first year student postural habits with studying and neuromuscular reflex from organ dysfunction. It may also reflect areas the second year students have developed more confidence with diagnosing and treatment skills. From the data it is clear that a substantial number of student patients had untreated pain and other medical issues. It is noteworthy that some of the first year students rated their pain levels rather high on an analog pain scale. Investigation into the affected organ systems identified complaints with 98% having a complaint of a musculoskeletal nature. Since the medical history was a voluntary self-disclosure, some visceral illness may have been interpreted by the second year students as musculoskeletal when, in reality, the identified dysfunction may have been the result of visceral disease. These results reinforce for both groups of students that their colleagues are a valuable resource for developing clinical skills, especially since the RPE tends to highlight that even healthy patients can have somatic dysfunction. The post-encounter survey completed by first year students generally indicated the positive benefit of this experience.

There is a growing movement within the osteopathic profession to improve medical education, particularly as concerns the attainment of primary care skills,[5,6] and to focus on osteopathic palpation and treatment skills. While standardized patients and patient simulators provide some clinical skill development, RPEs observed and critiqued by faculty members remain the optimal means of learning clinical skills.[7] Additionally, RPEs may have intrinsic value in the development of patient care behaviors consistent with the Stillian paradigm.[8] Presentation of this topic is temporally and philosophically congruent with efforts to inculcate professionalism, advance integrity, and demonstrate efficacy of osteopathic treatments at the colleges of osteopathic medicine.

In a literature search, it was found that no other osteopathic medical school has published information or results regarding the usage of a RPE-type tool in the training of entire classes of medical students. However, some studies have specifically looked at teaching students osteopathic techniques. Boulet et al. argue that student osteopathic manipulative treatment

(OMT) can be assessed using trained osteopathic physician raters and an objective rating tool.[9] Steele et al. showed that osteopathic medical students increased their confidence in their ability to do OMT by participating in a student OMT clinic.[10] Unlike the current study, neither of these studies assessed efficacy of the student-performed OMT, so comparison is limited.

Even though medical students are generally considered to be healthy, results of this study indicated that the first year students had detectable somatic dysfunction. It should be noted that the presence or lack of dysfunction is not solely dependent on general health status although it can sometimes be an indication of visceral illness. Further, the age range of the student patients was 20 to 37; therefore, the high values of self-rated pain also seem reasonable.[11] When comparing a comparable age group from another study,[12] the pain reported by our first year medical students was similar. However, the other study used the presence of low back pain as a marker for somatic dysfunction as opposed to an analog pain scale, thus representing a limitation of this comparison. Further, medical students may spend a disproportionate amount of time studying and may not take enough time for recreation, proper diet, or sleep, which may increase the number of complaints and make it even more difficult to compare the two studies. The observed pain scores in this study, however, do indicate a number of untreated body regions of somatic dysfunction in the first year medical student population. Typically, pain levels found in this range and above in similar populations affect quality of life, activities of daily living, and personal relationships as shown by Diepenmaat et al. in their study of an adolescent student population.[13]

Based on the first year students' post-encounter survey responses, students indicated that, overall, the second year student physicians provided good quality of care. Patient care and professionalism were also rated highly. The first year students scored the student physicians lower in categories involving delivery of osteopathic manipulative treatment and patient education. This may indicate a potential for curricular improvement by devoting more educational resources to these two areas. The lower satisfaction in the osteopathic manipulative treatment category is actually a relatively high patient satisfaction score and may be more reflective of those first year students with ongoing and chronic medical conditions for whom regular OMT would be more effective. For some, it may also be indicative of those student physicians who were less confident in their osteopathic knowledge base and required assistance from the supervising physician. The lower patient education score likely reflects less experience base and the lack of insight to provide patient education to resolve problems and prevent recurrences.

It is acknowledged that there is inherent bias in the RPE. First year students indicated only those medical conditions they felt comfortable divulging, and while some student physicians were able to detect areas of somatic dysfunction not indicated by the student patient, a lack of disclosure in the presenting complaint may have affected the student physician's ability to fully recognize the implications of their physical findings in this educational encounter. Further, due to slightly unequal numbers of first and second year students, some first year students were treated twice by different student physicians. In this instance, the second year student physician may have lost the full benefit of the encounter because the student patient had recently been treated. Also, the daily interaction between the two groups may decrease the novelty of the encounter for the second year student. Because the RPEs are an activity of the Department of Osteopathic Manipulative Medicine, there may also be a bias among the second year students in favor of diagnosing musculoskeletal problems.

In the future, there are some improvements which will be implemented to enhance the RPE experience and to provide better peer assessment and feedback. For instance, the follow-up surveys will include a posttreatment pain scale as well as measurements regarding activities of daily living and associated functions. The addition of these measures will help correlate the effectiveness and duration of the treatment with the treatment given and also provide invaluable feedback for the student physician concerning the efficacy of their osteopathic treatment.

Conclusions

This study has shown that second year student physicians display the ability to diagnose and treat somatic dysfunction with a high level of peer satisfaction. Results of this and other RPEs can provide useful pedagogical information for medical educators and osteopathic medical students, and be a valuable addition to other educational modes commonly employed at colleges of osteopathic medicine. In this study, the RPE provided useful information about skill set development and had a degree of patient care realism that would not otherwise be actualized. RPEs add a level of clinical reality for osteopathic medical students where each individual patient presents unique somatic dysfunction and real complaints. By participating in these encounters, first and second year medical students can more easily comprehend that their fellow classmates do typically have significant somatic dysfunction worthy of intervening with osteopathic manipulative treatment.

There appears to be a growing development of expectations within the osteopathic curriculum directed towards student competence in the seven core competencies and skill sets as a prerequisite for success on COMLEX Level I, II, III, and the PE component. It seems clear to us that the inculcation of behaviors in osteopathic manipulative medicine at the medical student level should lead to best practice patterns and advance the best medical care and practices consistent with the osteopathic paradigm. The educational benefit of the palpate and be palpated phenomenon, treat and be treated dictum seems to be reinforced by these real patient encounters performed by groups of students acting as patient and physician.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

Dr. Lockwood is the corresponding and primary author, involved in every aspect of the study and manuscript preparation. Dr. Snider is a coauthor and substantially aided in analysis of data as well as preparation and revision of the manuscript. Student-physician Chipman was involved with data entry, data analysis, and statistical computation. All authors read and approved the final manuscript.

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References

1. Steadman RH, Coates WC, Huang YM, et al. Simulation-based training is superior to problem-based learning for the acquisition of critical assessment and management skills. *Crit Care Med.* 2006. 34. 151-157
2. Block EF, Lottenberg L, Flint L, Jakobsen J, Liebnitzky D. Use of a human patient simulator for the advanced trauma life support course. *Am Surg.* 2002. 68. 648-651
3. Aamodt CB, Virtue DW, Dobbie AE. Trained standardized patients can train their peers to provide well-rated, cost-effective physical exam skills training to first-year medical students. *Fam Med.* 2006. 38.326-329
4. Bloom B. *Major categories in the taxonomy of educational objectives.* Available at: http.//www.iun.edu/~edusew/docs/2b_Tax_Cog_Domain.pdf. Accessed June 8, 2006
5. Gimpel JR. Getting "beyond the barriers" in reforming osteopathic medical education. *J Am Osteopath Assoc.* 2007. 107.270-275
6. Clawson DK, Jackson DW, Ostergaard DJ. It's past time to reform the musculoskeletal curriculum. *Acad Med.* 2001. 76.709-710
7. Holmboe ES. Faculty and the observation of trainees' clinical skills. problems and opportunities. *Acad Med.* 2004. 79.16-22
8. Rogers FJ, D'Alonzo GE, Glover JC, et al. Proposed tenets of osteopathic medicine and principles for patient care. *J Am Osteopath Assoc.* 2002. 102.63-65
9. Boulet JR, Gimpel JR, Dowling DJ, Finley M. Assessing the ability of medical students to perform osteopathic manipulative treatment techniques. *J Am Osteopath Assoc.* 2004. 104.203-211
10. Steele KM, Baker HH, Boxwell GF, Steele-Killeen S. Community-based osteopathic manipulative medicine student clinic changes in curriculum and student confidence levels. *J Am Osteopath Assoc.* 2005. 105.503-513
11. Papageorgiou AC, Croft PR, Ferry S, Jayson MI, Silman AJ. Estimating the prevalence of low back pain in the general population. Evidence from the South Manchester Back Pain Survey. *Spine.* 1995. 20.1889-1894
12. Snider KT, Johnson JC, Snider EJ, Degenhardt BF. Increased incidence and severity of somatic dysfunction in chronic low back pain. *J Am Osteopath Assoc.* In press
13. Diepenmaat AC, van der Wal MF, de Vet HC, Hirasing RA. Neck/shoulder, low back, and arm pain in relation to computer use, physical activity, stress, and depression among Dutch adolescents. *Pediatrics*. 2006. 117.412-416

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Post-Encounter Survey

Osteopathic Manipulative Medicine
1. The student physician was able to resolve my current somatic dysfunction component.
2. The student physician performed the osteopathic manipulative treatment in a manner that was reasonably comfortable for me.
3. The student's osteopathic manipulative treatment was thorough - he/she performed treatment including the primary area of complaint and associated areas.
4. The student physician performed the treatment in an organized fashion with smooth transition between techniques.
General Medical Knowledge
1. The student physician adequately reviewed my history, identifying key areas which required further history.
2. The student physician asked follow-up questions to determine details about my chief complaint.
3. The student physician exhibited adequate general medical knowledge.
Interpersonal and Communication Skills
1. The student physician presented himself/herself with professional speech and actions, including introducing himself/herself and asking questions in a polite, straightforward manner using appropriate language.
2. The student really listened to what I was saying, picked up on my nonverbal behavior, and asked follow-up questions to get more detail.
Patient Care
1. The student physician performed a proper physical examination based on my chief complaint and other aspects of my medical history.
2. The student physician successfully integrated osteopathic manipulative medicine elements into my physical examination.
Patient Education
1. The student physician addressed lifestyle changes that may be important to my health or chief complaint.
2. The student physician adequately educated me with respect to my general medical condition.
3. The student adequately educated me with respect to the osteopathic manipulative treatment or other osteopathic principles and practice.
Professionalism
1. The student physician managed his/her time well including arriving on time as well as devoting adequate and appropriate time for the elements of history, physical examination, and treatment.
2. The student physician was professional, competent, thorough, focused, decisive, and organized.
3. The student doctor acted in a professional, competent, thorough, focused, decisive, and organized manner.
4. The student physician exhibited professional appearance, such as wearing his/her laboratory coat, overall cleanliness, and items of personal grooming, jewelry, and hair color.
Overall
1. I was satisfied with the quality of care I was given. Based on this experience, I would trust my medical care to this doctor and follow his/her suggestions.
2. I would trust this student doctor with the care of one of my family members in the future.

AMERICAN OSTEOPATHIC ASSOCIATION

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RES. NO. 44 A/08 ACTION: APPROVED

SUBJECT: AMENDMENT TO BOARD ELIGIBILITY REQUIREMENT FOR AOA BOARD CERTIFICATION

SUBMITTED BY: Bureau of Osteopathic Specialists

In July 2008, the House of Delegates approved the following resolution:

WHEREAS, in February 2008, the AOA Board of Trustees approved the BOS recommendation to amend the AOA Board Eligibility process; and

WHEREAS, in April 2008, the BOS reviewed the approved Board of Trustees action and determined that a date of implementation had not been noted within the above stated process; and

WHEREAS, the BOS feels that appropriate notification of this significant change to the board eligibility process must be made prior to implementation; now, therefore be it

RESOLVED that the AOA Board of Trustees approve the BOS recommendation to have the new board eligibility process become effective July 1, 2009; and, be it further

RESOLVED that the effective date be widely communicated through The JAOA, The DO, the AOA Websites and through special notification to all osteopathic medical schools, osteopathic training programs and all specialty affiliates.

Explanatory Statement: To ensure that the profession and interested parties are aware of the newly approved AOA board eligibility process before it comes effective, the BOS Assembly voted to have that process become effective July 1, 2009 to ensure at least a one year window of notification of the change.

Reference: pp. 240-243

RES. NO. B28 M/08 ACTION: APPROVED

SUBJECT: AMENDMENT TO BOARD ELIGIBILITY REQUIREMENT FOR AOA BOARD CERTIFICATION

SUBMITTED BY: Bureau of Osteopathic Specialists

In February 2008, the Board of Trustees approved the following resolution:

WHEREAS, in November 2007 the Bureau of Osteopathic Specialists (BOS) reviewed a proposal from the BOS Executive Committee on revising the current BOS policy on board eligibility; and

WHEREAS, this proposal was set forth to address the issue of whether the process to obtain initial certification should be limited to a finite amount of time to obtain that certification; and

WHEREAS, it is conceivable that a certification candidate, under the current policy, could remain in the certification process on an indefinite basis; and

WHEREAS, such a process was felt to not be in the best interest of protecting the public and the objectives of the Quality Movement; and

WHEREAS, several AOA Certifying Boards already have a policy that limits how long a candidate can remain in the certification process; and

WHEREAS, the BOS voted to create a global BOS policy that would limit the amount of time in which a candidate must complete the certification process before losing that privilege permanently; now, therefore, be it

RESOLVED, that the AOA Board of Trustees approve the BOS recommendation of having candidates complete the entire process within the six-years of initial board eligibility with an opportunity for candidates to petition their certifying board to reenter the process one additional time, and be it further

RESOLVED, that the Board of Trustees also approve the BOS recommendation to also not allow further efforts to become certified if candidates do not complete the certification process at the conclusion of the reentry process.

(Continued RES. NO. B28 M/08 Page 2 - Amendment to Board Eligibility Requirement for AOA Board Certification)

Proposal to revise the current BOS Board Eligibility Process

1. A candidates for certification will have six years to be board eligible and complete the certification process.
2. At the end of six years of board eligibility, if the candidates has not obtained final certification, the candidate may petition the board to renter the certification process. The board will grant the candidate the ability to renter the process. The candidate must begin at the beginning of the process and must start at the next available administration of the exam. The candidate will have two attempts to pass each step of the examination process. If a failure of any of the steps occur the candidate must repeat that failure at the next available administration.
3. After exhausting the above process the candidate is not eligible to continue the process.
4. In order for a candidate to be eligible to reenter the certification process a candidate must re-petition the board. The board will establish criteria that must be met prior to granting re entry. The re entry process needs to be submitted and approved by the SRC of the BOS. The applicant upon approval of the board will follow the same process as outlined in number 2. If the candidate is unsuccessful in this attempt, there will be no further opportunities to become certified.
5. Certifying boards may have more stringent requirements in the limitation of time in which a candidate for certification must have complete the entire certification process.

Explanatory Statement: The BOS Assembly voted to approve the above revision to the board eligibility process in light of its move towards continuous certification. The proposed policy will ensure that candidates would not remain board eligible or in the certification process indefinitely. Such a policy change would be consistent with the BOS mission to help in the protection of the public by ensuring that candidates for certification complete the process within set parameters. Those not completing the process within the stipulated time would no longer be allowed to enter the certification process.

If the above recommendations are approved, the BOS will submit specific language to be approved for inclusion in the BOS Handbook at the July 2008 meeting of the AOA Board of Trustees.

Reference: pp. 224-226

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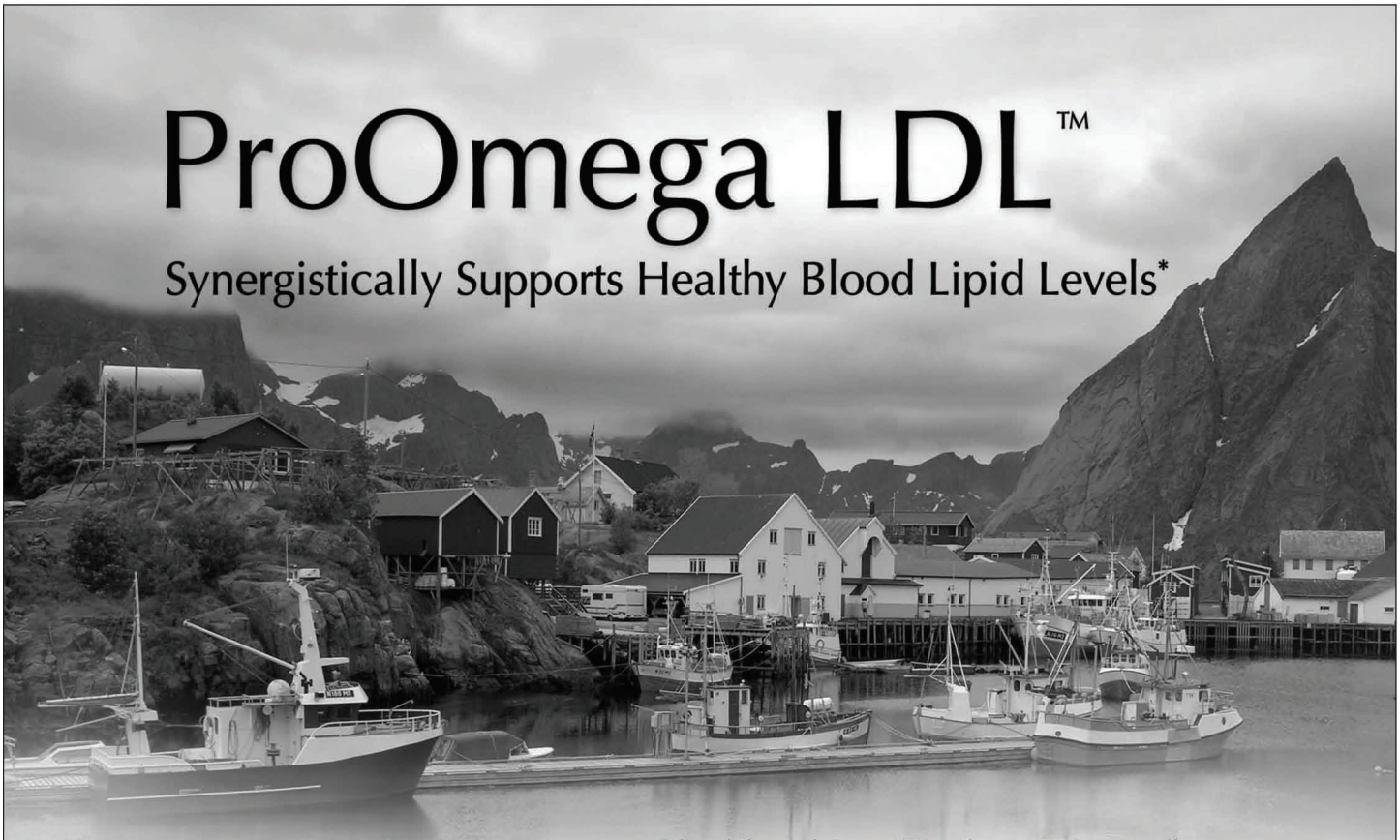

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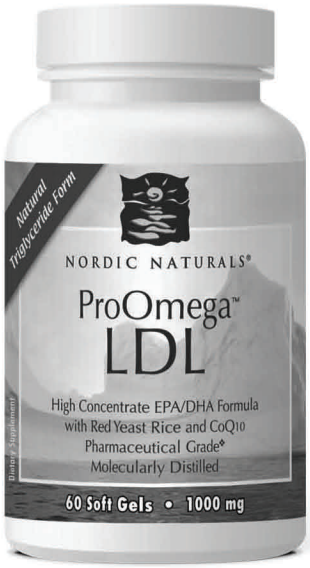

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1. Becker DJ, et al. Simvastatin vs. therapeutic lifestyle changes and supplements: randomized primary prevention trial. *Mayo Clin Proc* 2008; 83:758-764.

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The Detection and Recording of Cranial Rhythmic Impulse in Acupuncture Points using Surface Scanning Laser Displacement Meter and its Significance.

Krishnahari Pribadi

Abstract

This paper describes the use of an instrument called the Surface Scanning Laser Displacement Meter to detect, measure and record what appears to be cranial rhythmic impulse in several acupuncture points on a hand of a living human subject and to correlate the acupuncture pulsation of MUE49 of the right middle finger with the cranial motion obtained at the mastoid bone as detected and recorded with the same technique simultaneously. This research has proven objectively the presence of sinusoidal wave pulsation at the tip of the right mastoid bone (with a maximum deflection of 0.8 mm), the frequency of which is well within the range of cranial rhythmic impulse. Furthermore, this work has demonstrated objectively the presence of pulsations (with a maximum deflection of 0.07 mm and frequency range from 4 to 11 cpm) at several acupuncture points, the characteristics of which appear to be identified with the characteristics of the cranial rhythmic impulse. The characteristics of pulsations recorded from the tip of the right mastoid and the acupuncture point at the dorsal surface of the acupuncture point MUE49 of the right middle finger simultaneously appear to be similar. Incidentally, the experiment discovered a larger deflection of 0.25 mm with the frequency of almost one per minute (almost one wave per minute) which may indicate another type of body pulsation which has never been clearly identified or recognized previously. No significant bodily ill effects or influences upon the primary respiratory mechanism were noted during these experiments. Although correlation of pulsations recorded with this instrument with cranial rhythmic impulse detected by direct cranial palpation was not done, these experiments prove objectively the presence of pulsations at several acupuncture points and at the tip of the right mastoid bone. It is to be hoped that further well designed studies in the future using the same methods can clearly establish without any reasonable doubt that the pulsations recorded in these experiments are indeed the cranial rhythmic impulse.

Keywords: Acupuncture points, cranial motion, cranial rhythmic impulse, mastoid bone, MUE 49, Pribadi-Upleger's sign, Surface Scanning Laser Displacement Meter, significant detector.

Introduction

The cranial concept developed by the late Dr. William G. Sutherland of the USA established the primary respiratory mechanism as the highest regulatory mechanism in the body which generates its own pulsation called the cranial rhythmic impulse (CRI) that can be detected by a trained physician's hand in any parts of the human body. This fluid sinusoidal wave normally pulsates at 10 to 16 cycles per minute. This pulsation is considered to reflect the regulatory processes within the body and can determine the health status of an individual. Abnormal conditions of health can be reflected by changes in the frequency, amplitude and shape of the pulsation. Research devices have been developed to record objectively the presence of this pulsation in living animals and human body. It is thought that this pulsation is produced by the interaction of the five components of the system, namely: 1. the inherent mobility of the brain and spinal cord, 2. the reciprocal tension of the intracranial membranes, 3. the fluctuation of the cerebrospinal fluid, 4. the mobility of the cranial bones in their sutures, and 5. the involuntary movement of the sacrum.[6]

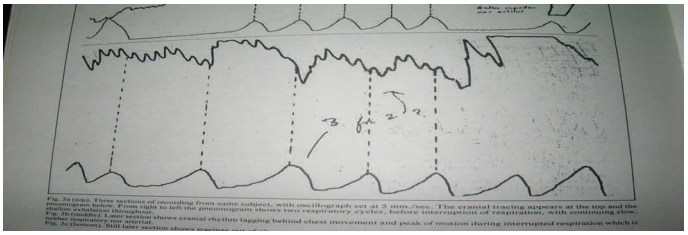


Figure 1. Polygraphic recording of CRI compared with respiration.[8]

Using cranial palpation method, the author discovered that acupuncture points pulsate at the frequency similar to the CRI and thought that CRI could also be detected at the acupuncture points. The quality of pulsation at the defined acupuncture points reflects the health status of that particular acupuncture points. Thus, determining the quality of pulsation at specific acupuncture points could assist in assessing the health status of the individual, particularly concerning the status of the meridians and the corresponding internal organs. In a paper published in 1998, the author proposed the interconnection between the primary respiratory mechanism and the acupuncture meridian system based on palpation findings in living human subjects that the cranial rhythmic impulse could be detected at acupuncture points. The author also introduced a term called the Upledger-Pribadi's sign to describe a clinical phenomenon in which the cranial rhythmic impulse is absent in pathological acupuncture points. Detection of the presence or absence of CRI on specific acupuncture points can be used to establish clinical diagnoses as disease patterns are specifically reflected in the patterns of abnormal acupuncture points. Abnormal points usually do not possess cranial rhythmic impulse when palpated by the physician's finger. By palpating pulsations at major acupuncture points, we can then readily establish the specific abnormal acupuncture profiles of the patients corresponding to the specific disease patterns.[1]

According to the classical acupuncture theory, the meridian channels serve as the conduit of nourishing and moistening fluids called the Qi and Blood between acupuncture points and

the internal organs served by the specific meridians.[2] It has been demonstrated that the acupuncture points possess electrical phenomena as objectively measured by electrical instruments that record electrical conductivity and electrical current. Usually, acupuncture points have higher electrical conductivity then the surrounding skin. Studies have shown that "fluctuations in cutaneous electric current over acupuncture points on certain channels coincided with variations in the functional activity of those internal organs associated with the channel."[3] It is suggested further that "the channels are a kind of axis for the biological electricity of the body, or an electric current, a special kind of electron or electron "bundle" which passes electromagnetic waves along a fixed course; that the electric phenomena of the skin reflect the electromagnetic field within the body, and just as the magnetic field within the body corresponds to the cosmos, changes in the cosmos may then be reflected in fluctuations in the electrical activity along the channels; and the Qi in traditional Chinese medicine is the equivalent of modern electromagnetic phenomena, etc."[4]

The idea that there is interconnection between the primary respiratory system and the acupuncture meridian system is further supported by the fact that when an acupuncture needle is inserted into a specific abnormal acupuncture point (for example Li 3 in liver disease) the cranial rhythmic impulse palpated at the head or any body parts will suddenly cease for up to 20 minutes. It will usually return at the completion of acupuncture treatment usually immediately prior to the removal of the needle. Furthermore, the disappearance of the cranial rhythmic impulse coincides with the "Qi sensation" obtained by the operator inserting the needle. This phenomenon is exactly the same as the still-point phenomenon obtained by still point techniques introduced by Upledger to manipulate and stimulate the primary respiratory mechanism (CV technique, sacral and leg technique).[5] Cranial manipulation techniques to correct abnormal cranial strain patterns usually also induce "still-point" in which no cranial rhythmic impulse is detected by the operator's hands before the completion of the procedures.[6] The cessation of cranial rhythmic impulse also occurs during Somato- Emotional Release in Craniosacral Therapy as developed by Upledger when significant emotions are being released and discharged when access to trauma memory is activated by a specific body position mimicking the original physical trauma. Upledger coined the term **"**the significance detector" to describe the signaling function of the cranial rhythmic impulse during treatment. When cranial rhythmic impulse suddenly stops during "therapeutic image" it usually signals that a significant stimulus (such as a visual image, a voice, a feeling or a sensation) is just about to enter awareness and there is "something good is happening inside". By exploring this significant image, idea, or sensation through dialogue to solve particular health issues that the person is experiencing, the cranial rhythmic impulse will return much stronger than before after completion of the treatment process.[7] Thus, it appears that during "still-point" induced by therapeutic procedures (such as cranial manipulation, somato-emotional release, therapeutic image, acupuncture)that affect and work through the primary respiratory mechanism, significant therapeutic processes are happening signaling systematic changes occurring within the primary respiratory mechanism.

Several devices and techniques have been developed to record cranial rhythmic impulse in living animals and human subjects using different methodologies such polygraphic recording, frequency oscillator technique, mechanical transducer, electronic transducer, etc.[8] Unfortunately, none of these techniques can be used to detect and record the cranial rhythmic impulse at acupuncture points as most of the pick-off sensors are too large to be applied to an acupuncture point. We need to have a microsensor that can detect the motion of the acupuncture point without detection of other waves or movements in the surrounding tissue such as skin, nail, or bone. In 2006, the author had the luck of being introduced to an instrument called the Surface Scanning Laser Displacement Meter which is capable of measuring and recording surface displacement as low as 0.01 micron.

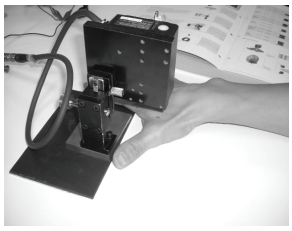
This paper describes the use of this instrument to detect, measure and record what appears to be cranial rhythmic impulse in several acupuncture points on a hand of a living human subject and to correlate this acupuncture pulsation with the cranial motion obtained at the mastoid bone as detected and recorded with the same technique simultaneously. Unfortunately, because of the cost, the author was not able to secure the instrument and be present during the experiments and had to be happy with designing several experiments to be conducted by a technician (not trained in osteopathy in the cranial field or acupuncture medicine) who happened to have access to the use of this instrument located in another country. These preliminary experiments were done to study if the instrument could be used to record cranial rhythmic impulse in a living human subject at specific acupuncture points and a selected mastoid bone and to study and correlate the characteristics of the recording. Once, the experiments establish the applicability of the instrument in measuring and recording cranial rhythmic impulse in living human subjects, more elaborate and well designed research experiments will be proposed and conducted to evaluate the validity, reliability, sensitivity and accuracy of the instrument in detecting, measuring and recording cranial rhythmic impulse in living human subjects non-invasively in the cranial bones, sacral bone, teeth, nail, hair, and acupuncture points and other structures in the body.

The author hopes that once it is established that the instrument can be used to non-invasively record cranial rhythmic impulse in living human subjects, we will develop a medical device that can be used clinically to diagnose cranial strain lesions and to monitor cranial osteopathic treatment process as well as a diagnostic device that can measure and record the cranial rhythmic impulse pattern at acupuncture points to help establish medical diagnosis as well as monitoring acupuncture treatment and designing acupuncture therapy plan. Theoretically, this instrument can also be used to detect any forces such as electromagnetic, light, physical, bio-energy, herbal, gems, homeopathic remedies, chemical drugs, toxins, etc., or even cosmic radiation in the outer space, or even mental and spiritual forces that may affect the primary respiratory mechanism in a negative or positive way. Finally, the objective recording of cranial rhythmic impulse in acupuncture points can thus support my hypothesis regarding the interconnection between the primary respiratory mechanism and the acupuncture meridian system as well as scientific evidence that the acupuncture meridian system does exist and the anatomical structure in the human (and animal) body could be then scientifically established.

Description of the instrument

Because a patent is pending regarding the applicability of this instrument (Surface Scanning Laser Displacement Meter) in measuring and recording cranial rhythmic impulse non-invasively in living human subjects, I will only describe the principle of working mechanism of the instrument and the characteristics of the instrument as it applies to the use in this experiment. This instrument has never been used medically to measure deflection, pulsation or dimensions of body micro-structures. However, it has been certified by the FDA that the laser used in this instrument is safe for humans as long as the light is not directed to the eyes.

Picture 1



The Laser Sensor Head

The CPU

Lap top monitor

Objectives, design and methods of the experiments

Objectives

To record and measure the dynamic displacement of specific acupuncture points as reflected by the dynamic skin surface displacement of the points.

To record and measure simultaneously the dynamic displacement of the mastoid bone and the dynamic displacement of a specific acupuncture (MUE49 of the right middle finger) and to study the relationship the two recording in terms of the frequency, amplitude, form of wave and chronological sequence.

To record and study the effect of external stimulation on the pericardium meridian (by placing the subject's hand on the pre-cordial chest area) upon the recording at the right mastoid and the MUE49 right middle finger.

To record pulsation of a non-acupuncture point (in this case, a point selected 3 mm lateral to MUE49 of the right middle finger) and to compare recording obtain from measurement of this non acupuncture point and an acupuncture point (the MUE49 at the dorsal surface of the tip of right middle finger).

To record and study the effect of external stimulation on the pericardium meridian (by placing the subject's hand on the pre-cordial chest area) upon the recording at the right mastoid and a non-acupuncture point (in this case, a point 3 mm lateral to the MUE49 right middle finger).

Design

A living human subject was selected arbitrarily without prior medical examination, cranial examination or particular selection procedures. The subject was instructed not to consume any herbal formulas, homeopathic preparations, or foods containing MSG, alcohol and chemical drugs 24 hours prior to the experiments. All metals and hand-phones were removed from the body of the subject during the experiments. The experiments were conducted in an air conditioned room not equipped with any screens or filters to screen out electromagnetic waves from the surrounding. The experiments were conducted in two stages: the first trial was conducted to record pulsations at specific acupuncture points located on the right hand of the subject. The second trial was conducted on a different day to record simultaneously the pulsations at the tip of the mastoid bone and a specific acupuncture point called Shiwang (MUE49) of the right middle finger and the effect of placing the subject's left hand on the pre-cordial area. This particular acupuncture point was selected because the author discovered by cranial palpation method that this point was associated with the pericardium meridian and reflected the function of the pericardium. Pulsation at this point as detected by cranial palpation technique suddenly stopped and remained to have no pulsation for up to 15 seconds when the non-palpating hand of the examiner was lightly placed on the subject's pre-cordial area. This sudden cessation of the pulsation at this acupuncture point was not replicated when the non-palpating hand was placed on the skin above other internal organs such as liver, stomach, gall bladder, kidney, bladder, intestines, lungs, etc. As it turned out all MUE49's of all fingers are associated with the internal organs: the left ones being with the Yin organs (heart, spleen, liver, kidney, lung) and the right ones are associated with the Yang organs (stomach, bladder, pericardium, large and small intestines, gall bladder). These 10 points can be found at the middle of the fingertip of each finger and in traditional Chinese medicine are used to treat heat exhaustion, acute gastroenteritis, common cold and paraplegia by pricking them with needles to let blood drops exude from them.[9] The laser head of the instrument is held firmly by a fixture which has a vertical adjustment. Two laser heads were used during the second trial to measure and record simultaneously the tip of the right mastoid bone and the MUE49 of the right middle finger. The focus point of the laser light was adjusted by moving the fixture vertically until the Laser Head showed effective range was captured. During the experiments the subject was instructed to be still and not to move his body, head and limbs as best as he could. During the first trial, the data captured for each acupuncture point was done for 15 seconds, whereas during the second trial, data captured for the tip of the mastoid and MUE49 was done for 60 seconds. The data of several thousand measurements was filed on the PC computer using Microsoft Office Excel program and the charts were generated and displayed in the monitor as well as printed out. The details of the positions of the subject during the trials were described below. The data and recording of all pulsations were examined, compared and analyzed by the author who has received a Certificate of Competency issued by The Cranial Academy in 1996. The data is stored in the computer and not included in this publication but available to any reader who wishes to study the data. A third trial was planned but was never executed due to the author's inability to travel to the site of the experiment outside the coun-

try because of financial constraints.

Methods

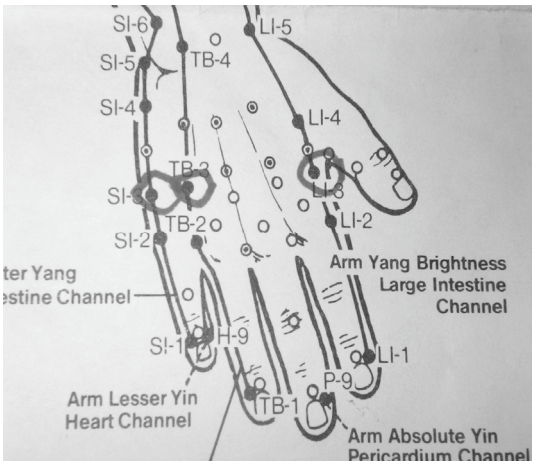
A. Cranial Rhythmic Impulse Measurement Procedures – First Trial

Objective

To record and measure the dynamic displacement of specific acupuncture points as reflected by the dynamic skin surface displacement of the points.

The first trial consists of taking measurements of the dynamic displacements of 3 specific acupuncture points, namely: LI – 3, TB – 3 and SI – 3 located on the right hand of a living human subject.

Picture 2



Picture 2. Locations of LI 3, TB-3 and SI 3 on the right hand

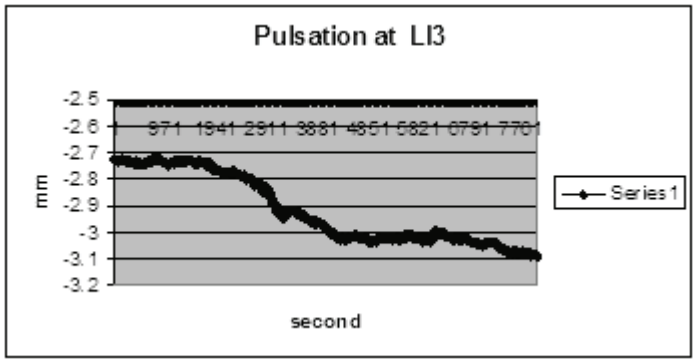
Steps

1. Place Hand underneath the Laser Head, the Laser Head is held firmly by a Fixture which has a vertical adjustment.
2. Test 1, Measurement taken on LI-3. Locate Laser Light onto LI-3, adjust the focus point by moving the fixture vertically until the Laser Head shows effective range is captured.
3. Start measurement by activating a start button on the PC Terminal.
4. Data was captured for around 15 sec.
5. Save Data on PC terminal.
6. Measurements were taken twice for all 3 locations (Experiments: 1,2,3,4,5,6).

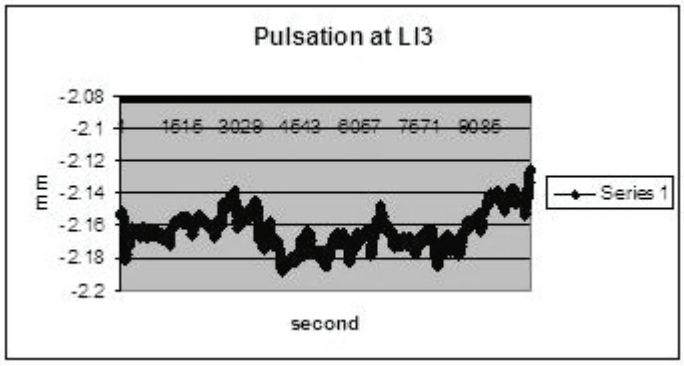
Recording of Trial Number 1

Objective: to measure and record pulsations at several acupuncture points located on the right hand of a living human subject (Large Intestine 3, Tripple Burner 3, and Small Intestine 3)

1. Recording of pulsation at an acupuncture point (LI 3) on the right hand.

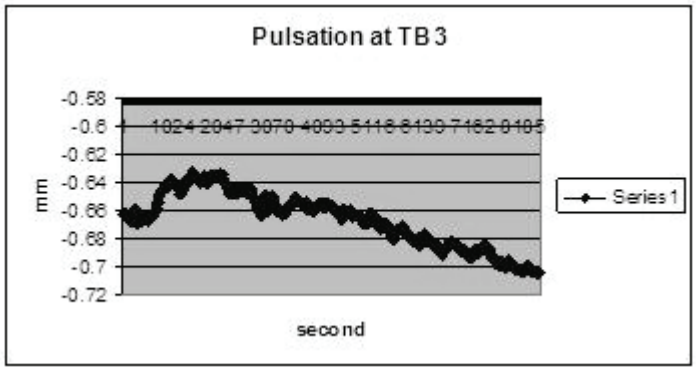


Graphic 1: Pulsation at LI3 (first recording)

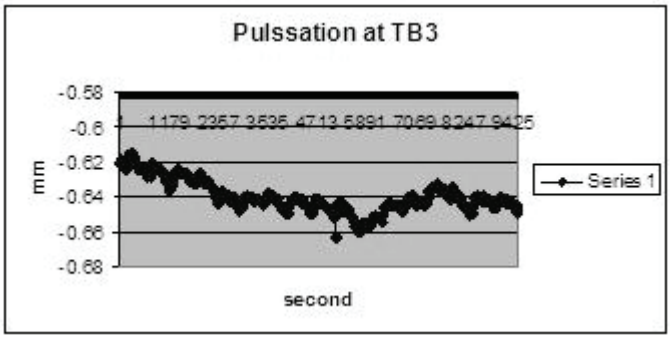


Graphic 2: Pulsation at LI3 (second recording)

2. Recording of pulsation at an acupuncture point (TB3) on the right hand.

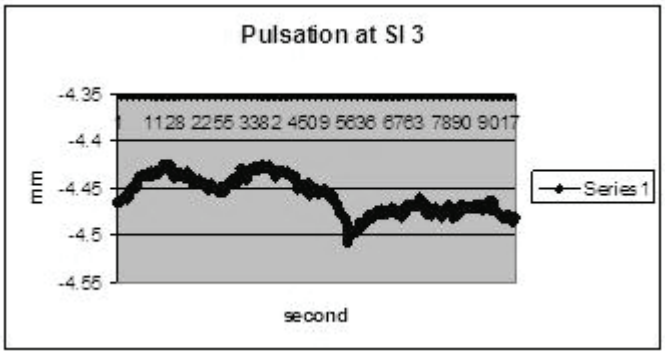


Graphic 3: Pulsation at TB3 (first recording)

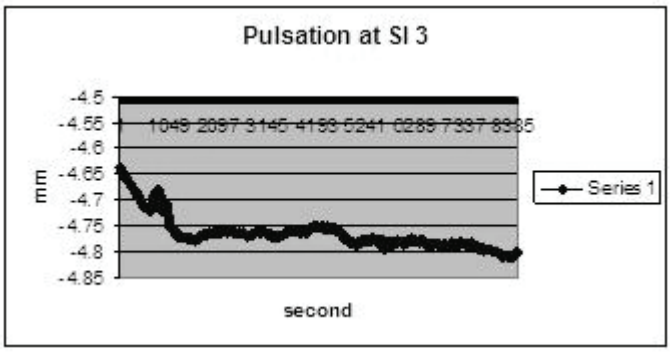


Graphic 4: Pulsation at TB3 (second recording)

3. Recording of pulsation at an acupuncture point (SI3) on the right hand



Graphic 5: Pulsation at SI 3 (first recording)



Graphic 6: Pulsation at SI 3 (second recoding)

B. Cranial Rhythmic Impulse Measurement Procedures – Second Trial

Objectives

1. To record and measure the dynamic displacement of the mastoid bone as reflected by the dynamic skin surface displacement of a point selected on one of the mastoid bone.
2. To record and measure simultaneously the dynamic displacement of the mastoid bone and the dynamic displacement of a specific acupuncture (MUE49 of the right middle finger) and to study the relationship the two recording in terms of the frequency, amplitude, form of wave and chronological sequence.
3. To record pulsation of a non- acupuncture point (in this case, a point selected 3 mm lateral to the selected acupuncture point)and to compare recording obtain from measurements of this non acupuncture point and an acupuncture point (the MUE49 at the dorsal surface of the tip of right middle finger).

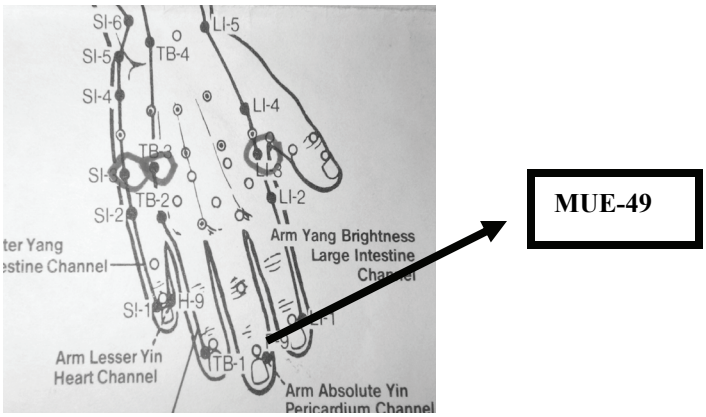
   To record and study the effect of external stimulation on the pericardium meridian (by placing the subject's left hand on the pre-cordial chest area) upon the recording at the right mastoid and the MUE49 right middle finger.

Steps

1. The measuring unit of the instrument is placed above the right mastoid bone of an individual. The individual lays on his left side and the right mastoid bone is located. The right mastoid bone is located behind the right ear as the most prominent triangular bone exactly behind the ear. The instrument is mounted on a static support. The individual is instructed as best as he can not to move his head, body, arms, hands and fingers. The point selected is the tip of the right mastoid bone and is marked by a reflecting paint from a silver marker. Then, the dynamic displacements of the selected point are measured by the instrument and recorded serially for 60 seconds. The serial recording graph is displayed on the screen and printed out.

   A second measuring unit is placed above the MUE49 point of the right middle finger. The MUE49 point is located exactly at the center of an imagined line drew from the midpoint of the central border (border closer to the wrist) of the nail of the right middle finger and the midpoint of the digital crease between the last and the middle carpal bones of the middle finger. The right hand is placed in front of his body on a flat surface such as the flat surface of the table where the subject lays with the dorsal part faced above. The instrument is mounted on a static support above the selected point. The individual is instructed as best as he can not to move his head, his body, his arms, hands and fingers. The point selected is marked by a reflecting paint from a silver marker. Then, the dynamic displacements of the selected point are measured by the instrument and recorded serially for 60 seconds. The recording graph is then recorded and printed out.

Picture 3

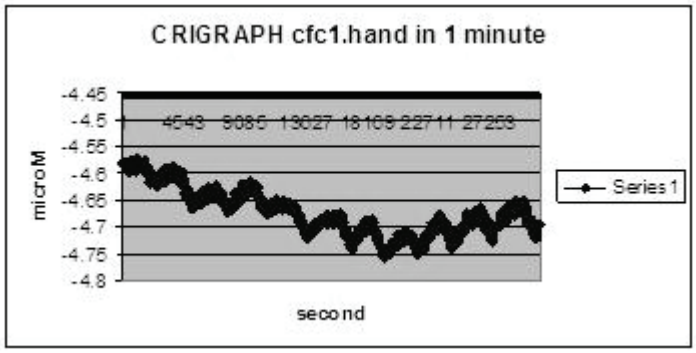


Picture 3. Location of MUE49

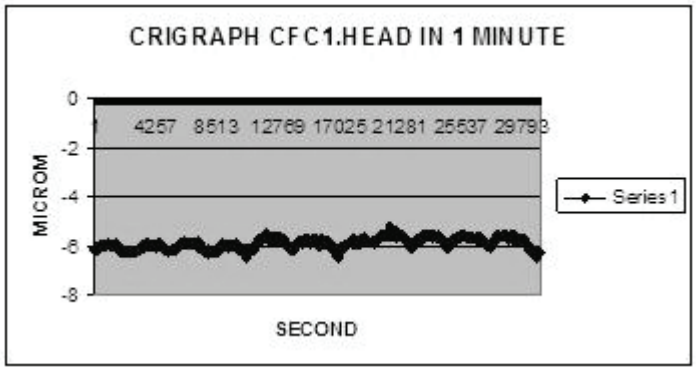
2. Immediately after completing the step 1, have the subject touch his chest skin above his heart (by simply placing his left palm on the left breast: Repeat Step 1 for another minute simultaneously.
3. After a rest of 5 minutes with left hand off the chest area, then shift the measuring instrument above the respective MUE49 to measure pulsation at a non-acupuncture point about 3 mm off the respective MUE49 to the right (toward the right little finger) and simultaneously measure pulsation at the point of the right mastoid bone.

Recording of Trial Number 2

1. To record and measure simultaneously the dynamic displacements of the tip of the right mastoid and the MUE49 of the right middle finger

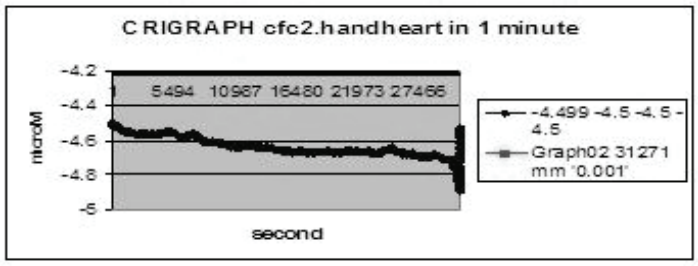


Graphic 1: Pulsation at MUE49 of the right middle finger.

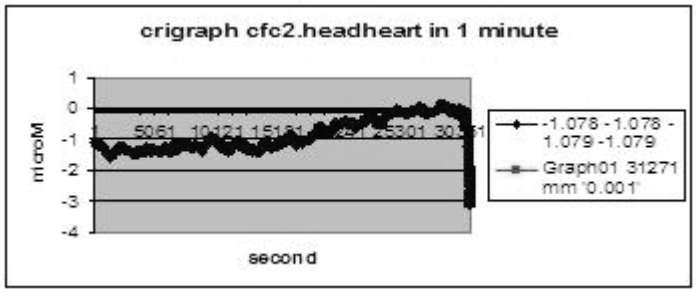


Graphic 2: Pulsation at the tip of the right mastoid

1. To record the effect of external stimulation (by placing the subject's right hand lightly on his precordial area) on the pericardium (circulation) meridian upon the recording at the right mastoid and the MUE49 right middle finger.

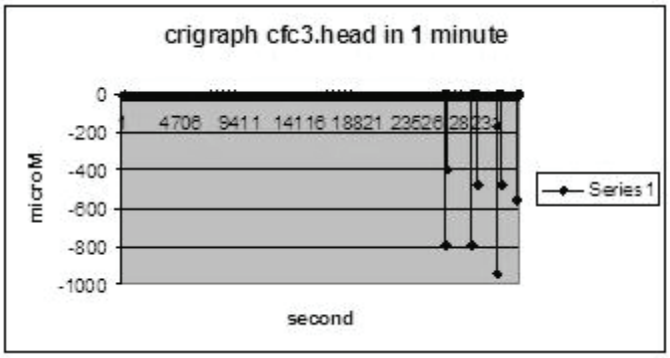


Graphic 3: Pulsation at MUE49 of the right middle finger during placement of right hand on precordial area.

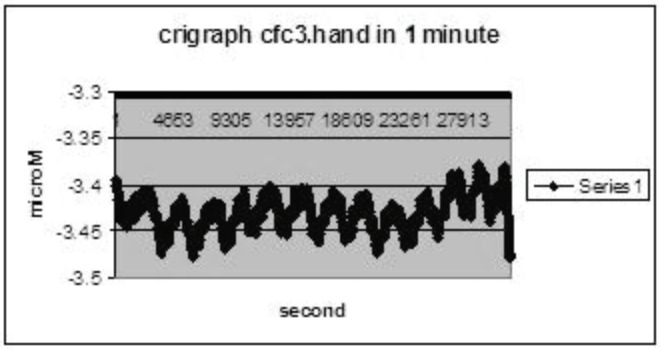


Graphic 4: Pulsation at the tip of right mastoid during placement of right hand on precordial area.

STEP 3: To compare recording obtain from measurements of a non acupuncture point (a point selected 3 mm lateral to MUE49 of right middle finger) and the tip of the right mastoid with the right hand off the precordial area



Graphic 5: Pulsation at a non-acupuncture point 3 mm off MUE49 with left hand off the precordial area.



Graphic 6: Pulsation at the tip of right mastoid with left hand off the precordial area.

C. Cranial Rhythmic Impulse Measurement Procedures – Third Trial (this trial has never been done as the author was not able to travel to the location of the experiment outside the country)

Objective

To verify if the recording produced is identified and similar with the CRI obtained clinically by a certified cranial osteopathic physician on the same individual.

Step

While the pulsation at the tip of the right mastoid bone of the subject is measured and recorded by the instrument, the CRI at the head is palpated by a certified Cranial Osteopathic Physician who records the finding regarding the frequency, amplitude, and wave-forms. This recording is compared with the recording obtained by the instrument.

Discussions

The recording of pulsations at the three acupuncture points (namely: LI – 3, TB – 3 and SI – 3 located on the right hand of a living human subject) distinctly demonstrates large sinusoidal waveforms of different shapes and frequencies mixed with more rapid smaller sharp pulsations. Variations of patterns of the sinusoidal waveforms are noted even at the same point during the first and second recording for each acupuncture point. The shapes, frequencies and amplitudes of pulsations at the three acupuncture points (located at different meridians, namely: large intestine, triple burner and small intestine) are also different. During the first recording of point L1, the maximum deflection is 0. 3 mm and the frequency of the sinusoidal wave is approximately 4 cycle per minute, whereas second recording of the same point reveals maximum deflection of 0.07 mm with the frequency being 10 cycles per minute (there are 2.5 sinusoidal waves per 15 seconds). This figure correspondents exactly with the normal CRI frequency (10 to 16 cycles per minute). The frequency of the tiny pulsation of the second recording of LI 3 is approximately 80 per minute (approximately 20 tiny pulsations per 15 seconds) which is in the range of cardiac pulsation. Unfortunately, we did not record the CRI frequency and radial pulse of the subject at the same time. The tiny pulsation recorded from TB 3 demonstrates frequency at 68 beats per minute (17 beats per 15 seconds). Whereas the frequency of the tiny pulsation recorded from SI 3 is approximately 112 per minute (28 tiny waves per 15 seconds), again within the range of the frequency of cardiac pulsation. This indicates that the subject experienced acceleration of his heart rate during this experiment. Distinct sinusoidal waves are identified in first recording of SI 3 at the frequency of 12 cycles per minute (or 3 waves per 15 seconds) and with maximum deflection of 0.04 mm. The second recoding of SI 3 reveals one half sinusoidal wave followed by absence of sinusoidal waves with a maximum deflection of 0.,15 mm. The first recoding of TB 3 shows frequency of sinusoidal waves at 4 cycles per minute (1 wave per 15 seconds) and maximum deflection of 0.07 mm, whereas second recording indicates frequency at 6 cpm (1.5 waves per 15 seconds) and a maximum deflection of 0.05 mm.

In summary, the first experiment clearly demonstrates sinusoidal waves at three acupuncture points at frequencies ranging from 4 to 12 cycles per minute (within the frequency range of cranial rhythmic impulse) and deflections ranging from 0.05 mm to 0.15 mm. Tiny sharp pulsations are noted with the frequencies ranging from 68 beats to 112 beats per minute, within the range of the frequencies of cardiac pulsation. If we accept the hypothesis that acupuncture pulsations at acupuncture points reflect functioning of organs or processes within the organs, this experiment reveals that the subject was experiencing variable functioning of the three meridians: large intestine, triple burner (or endocrine) and small intestine. LI 3 (Sanjian) is the transporting point of large intestine and is indicated for the treatment of tooth ache, sore throat, trigeminal neuralgia, painful eyes, malaria and the inflammation of dorsum of the hand. TB 3 (Zhongzu) is the transporting point of the Tripple Burner (facilitates the circulation of Qi and benefits the ear) and is indicated to treat deaf mutism, tinnitus, deafness, headache, neuralgia, etc.). SI 3 (Houxi) is the transporting point of the small intestine and the meeting point of the governing channel on the small intestine and relaxes the muscle channels, opens the governing channels and clears the Spirit. It is indicated in malaria, seizures, psychosis, hysteria, intercostals neuralgia, night sweats, stiff neck, low back pain and deaf mutism. Unfortunately, we do not have the medical record or clinical history of the subject to enable us to correlate these findings with clinical data.

Capturing the data around 60 seconds for each experiment during the second trial clearly eliminates the sharp pulsations "cardiac pulsations" and amplifies the sinusoidal waves "cranial rhythmic impulse" of the recording of pulsations obtained from the tip of the right mastoid and the right MUE49 of the right middle finger. The first experiment clearly demonstrates the similarities of the frequencies, shapes and phases of the pulsations obtained from the tip of the right mastoid and the right MUE49. A larger deflection of 0.25 mm with the frequency of almost one per minute (almost one wave per minute) is noted on the first recording obtained from the acupuncture point MUE49. This may indicates another type of body pulsation which has never been clearly identified or recognized previously. Perhaps it reflects the whole body pulsation as the body swells and shrinks at the frequency of one per minute in response to cosmic fluctuation. The frequency of acupuncture pulsation at MUE49 is about 11 per minute, exactly the same as the number for the frequency pulsation at the tip of the right mastoid bone. This clearly is within the normal frequency range of normal cranial rhythmic impulse which is between 10 to 16 cycles per minute. The maximum deflection of the MUE49 pulsation is 0.07 mm, whereas the tip of the right mastoid deflects approximately 0.8 mm (almost ten times of the acupuncture deflection). This wide deflection indicates that the pulsation recorded at the tip of the right mastoid was most likely associated with bone movements (in this case the right mastoid) rather than pulsation of an acupuncture point located at the tip of the mastoid bone. Although we did not correlate this pulsation with cranial rhythmic impulse palpated at the cranium of the subject clinically, we can be sure that this recorded pulsation is identified with the cranial rhythmic impulse. This experiment clearly demonstrates the presence of CRI at an acupuncture point as the acupuncture pulsation shows exactly the same frequency, waveforms, and phases as the recording of pulsation obtained simultaneously with the same instrument (using a second sensor) from the tip of the right mastoid. The instrument indeed was able to detect and record objectively pulsation at the tip of the right mastoid which appears to

be the cranial rhythmic impulse of the subject. It appears that the pulsation recorded at the MUE49 preceded the pulsation at that tip of the right mastoid by approximately a half second (which appears to correspondent with clinical finding: simultaneous cranial palpation of the right MUE49 and the tip of right mastoid bone demonstrates time difference). This finding supports the idea that there is movement of fluids within the acupuncture meridian and the primary respiratory mechanism, the direction being from the acupuncture points, meridian channels and to the primary respiratory mechanism (tip of the right mastoid) and back.

The second experiment of the second trial reveals different characteristics of pulsations at the acupuncture point (MUE49) and the tip of the right mastoid. Immediately, after the left palm of the subject was placed on the pre-cordial chest area, a sudden cessation of the acupuncture pulsation and an absence of this pulsation for almost 60 seconds appeared which was followed by a sudden large displacement of 0.4 mm distance. This was accompanied by sharp waves of 16 cycles per minute recorded at the tip of the right mastoid bone which was also followed abruptly by a negative deflection of 3 mm distance (sudden external rotation of the right temporal bone). This can be interpreted that the placement of the left palm on the pre-cordial area blocks the flow of fluids within the pericardium meridian which causes accumulation of cerebrospinal fluid within the primary respiratory mechanism as evidenced by acceleration of the cranial rhythmic impulse (from 11 cycles per minute to 16 cycles per minute). Again, it supports the contention that there is interconnection between the two fluid space systems. The sudden wide deflections recorded at both points signifies an escape phenomenon: the mounting pressure within the fluid space of the two systems overcame the fluid restriction at the pericardium area exerted by placing of the hand on the pre-cordial area. This phenomenon occurs also during induction of still-point by putting the primary respiratory mechanism into extreme extension with the CV4, sacral compression and leg techniques introduced by Upledger. Thus, by simply placing a hand on the skin surface of an organ one can induce a still-point and improves the primary respiratory mechanism! This can be simply demonstrated clinically by monitoring the CRI at the head while placing the non-monitoring hand on the skin surface of various organs successively. Thus, the interconnection between the primary respiratory mechanism, internal organs and the acupuncture meridian system is clearly established.

The third experiment of the second trial clearly shows that a point on the skin 3 mm off the MUE49 pulsates at a frequency higher than the acupuncture point itself (14 cpm as opposed to 11 cpm) of the same subject. Puzzlingly, simultaneous recording of the tip of the right mastoid reveals the compete absence of pulsation interspersed with about 8 wide deflections (which can be artifacts produced by sudden movements of the head of the subject because of fatigue). The process of recording of a non-acupuncture point (perhaps a point at the wall of a meridian channel?) appears to be accompanied by a prolonged still point of the primary respiratory mechanism. Perhaps the laser light used in this measuring process stimulates the primary respiratory mechanism to undergo a still-point without concomitant cessation of the acupuncture pulsation, thus demonstrating the sensitivity of the system to light energy as well as the connection between the meridian channel and the primary respiratory mechanism. However, measuring pulsations at acupuncture points using this instrument does not cause a still –point of the CRI at the head.

Indeed, clinical cranial palpation of the walls of meridian channels demonstrates higher frequencies of channel pulsations compared to frequencies of pulsations at the acupuncture points and the head. Perhaps, the walls of meridian channels are formed by cells that pulsate at higher frequencies which function to prevent fluids from escaping from the channels, and to direct and pump the fluids within the channels to move along the courses of the channels. The presence of the walls of the meridian channels may not be apparent on dissected tissues of dead human subjects or animals, just as cranial rhythmic impulse is not obtainable in dead human subjects or animals. This phenomenon (higher frequencies of pulsations of the channel walls) can be exploited to detect and map out the anatomy structure of the meridian channels by recording the pulsations of channels using this instrument. It appears that other structures of the skin do not posses pulsations at higher frequencies than the frequency of CRI unless they are functionally abnormal.

Summary, significance, and scientific values of these findings

This preliminary research has proven objectively the presence of sinusoidal wave pulsation at the tip of the right mastoid bone (with a maximum deflection of 0.8 mm), the frequency of which is well within the range of cranial rhythmic impulse. Furthermore, this work has demonstrated objectively the presence of pulsations (with a maximum deflection of 0.07 mm and frequency range from 4 to 11 cpm) at several acupuncture points, the characteristics of which appear to be identified with the characteristics of the cranial rhythmic impulse. Incidentally, the experiment discovered a larger deflection of 0.25 mm with the frequency of almost one per minute (almost one wave per minute) which may indicate another type of body pulsation which has never been clearly identified or recognized previously. The instrument is sensitive and specific enough to detect and record pulsations at acupuncture points and at the skin surface of a bone (in this case the right mastoid bone) without picking up other body pulsations or waves (such as respiration, muscular contractions, organ movements, etc.) with the exception of cardiac pulsation. Capturing the data around 60 seconds for each experiment during the second trial clearly eliminates the sharp pulsations “cardiac pulsations” and amplifies the sinusoidal waves “cranial rhythmic impulse” of the recorded pulsations. No significant bodily ill effects or influences upon the primary respiratory mechanism were noted during the experiments. However, a prolonged still point occurred while the instrument was measuring the pulsation of a point located approximately 3 mm off the acupuncture point, which may well be the channel wall of a meridian or the wall of an acupuncture point. This point exhibited a pulsation at a higher frequency then the acupuncture point itself. Placing a hand on the corresponding organ (pericardium in this case) induced cessation of pulsation at the acupuncture point related to the organ and stimulated the primary respiratory mechanism with acceleration of the pulsation at the tip of the right mastoid bone. This phenomenon was followed by larger sudden deflections of both points. Although correlation of pulsations recorded with this instrument with cranial rhythmic impulse detected by direct cranial palpation was not done, these experiments prove objectively the presence of pulsations at sev-

eral acupuncture points and at the tip of the right mastoid bone. It is to be hoped that further well designed researches in the future using the same methods can clearly establish without any reasonable doubt that the pulsations recorded in these experiments are indeed the cranial rhythmic impulse.

The interconnection of the primary respiratory mechanism and the acupuncture meridian system demonstrates that the highest body regulatory system is established through fluid wave pulsations generated by these two systems which travel along the peripheral nerves and meridian channels which are connected to the spinal cord and the brain. It is the author's contention that information from one to the other system (and the brain and spinal cord) and all organs (and cells)is transmitted via the fluids that travel from the primary respiratory mechanism system (the cerebrospinal fluid), through the nerves and exude at the nerve endings and enter the thousands of acupuncture points to follow the courses of all meridians and organs and back to to the primary respiratory mechanism system. The meridian channels not only contain "the Qi and the Blood and the corresponding Yin and Yang energies" as explicated by the traditional Chinese medicine, but may also contain the cerebrospinal fluid (and all the physical, chemical and electrical components) generated by the brain via the interconnection of the two systems. Thus, this theory explains the efficacies as well as the wide clinical application of cranial osteopathic manipulation and acupuncture treatment in various maladies of human beings and animals as well. These two systems are sensitive to physical, chemical, electrical as well as light energy and other form of bio-energies. The physical force responsible for pumping the meridian channel fluids to travel in the meridian channels is none but the pumping action of the primary respiratory mechanism delivered by the pulsatile movement of the primary respiratory mechanism known as the "cranial rhythmic impulse". Physical restrictions in the primary respiratory mechanism may cause slowing of fluids (and bio-energy) movements within the meridian channels and abnormal functioning of acupuncture points may cause abnormal functioning on the primary respiratory mechanism. These experiments may have established the anatomical presence of the primary respiratory mechanism (and its pulsation) and the acupuncture meridian system (and its pulsation) and their interconnection. Future work may yield more data and findings to support this hypothesis.

This Surface Scanning Laser Displacement Meter may well be the instrument capable of detecting minute pulsations of the two systems and their anatomical parts and structures and may have applications in research and clinical work in cranial osteopathy and acupuncture medicine and eventually may help unravel the secrets of the working of human anatomy and physiology in health and diseases. This instrument may prove to be useful in mapping out the anatomy structure of the acupuncture meridian system, namely the meridian channels and their routes and acupuncture points and their interconnections and the specific physiological regulatory functions of all acupuncture points. Perhaps, more meridians and acupuncture points and their specific regulatory roles will be discovered further.

References

1. Pribadi K. Psychosynergisis, A Synthesis of Osteopathic Medicine, Acupuncture Medicine and Homeopathy in Psychiatry. *AAOJ.8:1*.29-35.
2. O'Connor J and Bensky. *Acupuncture, A Comprehensive Text*. Seattle. Eastland Press, 1987 pp. 34
3. ibid, pp. 106-107
4. ibid, p. 107
5. Upledger, J. E. and Vredevoogd, J. D.: *Craniosacral Th*erapy, Seattle. Eastland Press, 1987
6. Magoun HJ. *Osteopathy in the cranial fie*ld. Idaho: The Cranial Academy, 1976.
7. Upledger, *Somato Emotional Release and Beyond*, Seattle: Eastland Press, 1988, pp. 132-135
8. Frymann V M.A Study of the Rhytmic Motions of the Living Cranium. *JAOA*. Vol 70. May 1971. pp. 928-945
9. O'Connor J and Bensky. *Acupuncture, A Comprehensive Text*. Seattle. Eastland Press, 1987, p. 386 and p. 615

* The author thanks to Mr. Edwin Purwanto, who introduced him to this instrument and proposed that this instrument could be used to detect cranial rhythmic impulse in living human subjects and to Mr. Cheng Choong Foo, who intelligently and carefully conducted all the experiments under the author's direction. Without their contributions, this work could have never been done.

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Healing Hands: Using Osteopathic Manipulative Treatment to Address Visceral Structures through Somatovisceral Reflexes:
A Case Study in Gastroesophageal Reflux Disease

Beau Branyon

The field of osteopathy is a total system of health care which professes and teaches the osteopathic philosophy based upon four key principles.

1. The body is a unit.
2. It has its own self-protecting and regulating mechanisms.
3. Structure and function are reciprocally interrelated.
4. Treatment considers the preceding three principles.

Perhaps no other field of study within osteopathic medicine epitomizes these principles more clearly than somatovisceral reflexes and the application of these connections to achieve optimal treatment for the patient.

The interrelationship of structure and function is vividly portrayed by the interplay between the somatic and visceral structures. Propriocepter input from somatic dysfunction may facilitate a cord segment. If that cord segment is also the site of the cell bodies for sympathetic outflow to a visceral structure, that particular visceral structure's function may be affected by excessive sympathetic tone. The exchange from somatic sensory to visceral sympathetic outflow occurs by way of the facilitated cord segment and is called the somatovisceral reflex.[2]

According to Irvin M. Korr, Phd, facilitated spinal cord segments encourage and support physiological, hormonal and biochemical conditions which increase a patient's complications and slow or inhibit a patient's recovery from dysfunction or disease. The classic terminology is that the facilitated segment acts as a "neurologic lens", focusing stressor input upon target viscera.[2]

Research by Reflex Neurophysiologist Michael Patterson has found evidence that early osteopathic manipulation of somatic dysfunction might be a form of preventative medicine. Some of his research on animals has fostered the following conclusions.

1. Persistent musculoskeletal dysfunction affecting a certain spinal cord segment can affect the function of an internal organ related to that same spinal cord segment for its innervation.
2. Removal of the musculoskeletal irritation of dysfunction allows the related internal organ to return to its normal function.

If the dysfunction of the musculoskeletal system remains long enough, it apparently "burns a memory pattern" within the central nervous system so that when the initial irritating musculoskeletal influence is removed, the original dysfunction not only continues but grows in severity.[2]

The research literature has established a clear interconnection between somatic dysfunction and visceral pathology. The well trained osteopathic physician is equipped with the knowledge and skill to assess and treat visceral pathology with manipulation. The objective is to find the somatic dysfunction which correlates to the visceral pathology and treat the lesion in order to re-establish normal function within the viscera before the pathologic "memory pattern" sets in.

Case

This is a retrospective case study of a now 58-year-old white female professor presenting with chronic pain in the neck and upper back secondary to excessive reading and computer work required of a college professor. The patient reported that OMT was therapeutic for her chronic pain. *The patient's history includes a fracture of the mid-thoracic spine in her teens*. She could not recall the exact spinal vertebrae involved in the fracture. She later developed Gastro-esophageal reflux disease (GERD) in 2005. She was prescribed Prilosec and Protonix for her GERD. At the time of her diagnosis of GERD she had profound epigastric pain and described an effortless return of gastric contents into the pharynx without nausea, retching, or abdominal contractions. The Prilosec and Protonix gave some relief, but the symptoms continued to persist. Her past medical history also consisted of mitral valve prolapsed diagnosed in 1968 at age 20. She currently takes Inderal for her heart condition. Family history consists of heart valve disease including mother, father and sister.

Physical Exam (structural evaluation)

WT: 172
BP: 110/70
HR: 62
Resp: 12
Cervicals: OA SLRR Right levator scapula tightness
Thoracics: *T4-T6 SRRL*
Lumbars: unremarkable
Sacrum: mild posterior right sacroiliac tenderpoint
Pelvis: Right innominate anterior
Ribs: *TART changes at the T5 and rib 5*

Diagnosis

When the patient presented for her first visit on 8/05, she had recently been diagnosed with GERD by her primary care physician. She had somatic dysfunction located at the OA and thoracic spine. She also had TART changes at T5 and rib 5.

Therapy and Clinical Course

The patient received treatment of the above mentioned areas once a month over a 14-month period. Treatment consisted of condylar decompression to normalize parasympathetic tone. Soft tissue and rib raising techniques were used around the area of T5-T9 to normalize sympathetic tone. This was accompanied by muscle energy techniques to address patterns of segmental facilitation and their resulting somatic dysfunction. Celiac Ganglion release was also used to address the collateral sympathetic ganglion in order to further normalize hypersympathetic outflow to the upper gastrointestinal tract.

The patient responded well to osteopathic manipulative treatment (OMT). She reported drastic improvement of her GERD symptoms since the beginning of her therapy. She has

also decreased the number of prescription medications used for GERD. She now takes only a low dose of Nexium. The patient will continue to follow up monthly with the OMT physician for maintenance on chronic pain secondary to work posture. Special emphasis will continue on the areas of somatic dysfunction related to the somatovisceral regulation of her GERD symptoms.

Review of the Literature

Gastroesophageal Reflux Disease (GERD) is defined as symptoms or mucosal damage produced by the abnormal reflux of gastric contents into the esophagus. The cardinal symptoms associated with GERD are heartburn and regurgitation. Sympathetic innervation to the upper gastrointestinal tract including the esophagus and stomach originates from T5-T9 forming the Greater Splanchnic Nerve which synapses at the Celiac Ganglion. The effects of increased sympathetic innervation to the gastrointestinal tract include increased vascular tone leading to decreased oxygen and nutrients to tissues and decreased peristalsis leading to constipation. Parasympathetic innervation to the lower 2/3 of the esophagus and the stomach is provided by the vagus nerve (CN X). Increased parasympathetic activity increases acid secretion and the rate of gut peristalsis.

Understanding the areas of origin of autonomic outflow is of the utmost importance when one takes into consideration the somatovisceral connection within the patient. Akio Sato, MD, PhD (1970-1990) performed experiments with rats and cats and was able to show that somatic nerve stimulation can affect cardiovascular and GI tract depending on which area of the soma is stimulated and the strength of stimulation. After completing his research, Sato concluded,"…the functions of various visceral organs can be influenced by a proper cutaneous stimulation as a result of the somatosympathetic or the somatoparasympathetic reflexes. I hope this knowledge is used to carry out similar experimentation in other mammals and that finally this knowledge will be clinically useful in altering the visceral function of humans."[5] The experiments of Friedman, PhD, Hudson, DO, and Young, DO further confirmed the somatovisceral connection. In these studies the paravertebral muscles of dogs were stimulated both mechanically and electrically. Stimulation in the area of T3 -T7 produced duodenal contractions of high amplitude.[1]

Some of the earliest research on the connection between the soma and viscera was carried out during the first half of the 20th century by Louisa Burns, DO and her coworkers and assistants. They used thousands of animals including rats, rabbits, guinea pigs, goats, dogs, and others. They would produce spinal lesions within the animal similar to those found in humans. The findings were remarkable. Lesioning T4 would produce and increase in heart rate and a disturbance of cardiac rhythm, unless the lesion was reduced. After reduction of the lesion, function of the viscera was returned to normal.[4] In the gastrointestinal tract it was found that lesions to T4-T5 resulted in hyperemia of the gastric mucosa and excessive formation of gastric acid. Lesioning of T7 was followed by vascular changes in the stomach.[4] Some areas of the stomach were injected, while other areas blood supply was decreased, secondary to an imbalance of sympathetic and parasympathetic outflow to the tissue. These findings have clearly shown that the osteopathic spinal lesion can result locally in a lesion in the nervous system and reflexively in visceral pathology. The research also shows that correcting somatic dysfunction can have a therapeutic affect on corresponding viscera.

Discussion

In the case of the 58-year-old professor, it is very interesting that she had a history of a fracture to the mid thoracic spine in her teenage years. This trauma could have set in motion a somatic dysfunction that after years of degeneration preceded to facilitate a cord segment (T5-T9) corresponding to the sympathetic outflow to the upper gastrointestinal tract. With this idea in mind, and recalling the theories of Reflex Neurophysiologist Michael Patterson, PhD, it stands to reason that correcting the somatic dysfunction in the areas of sympathetic and parasympathetic outflow will improve visceral function in the corresponding area.

Treatment was focused on the area of T5-T9 in order to normalize sympathetic tone to the upper gastrointestinal tract. Theoretically treatment of this area should balance vascular tone leading to the arrival of increased oxygen and nutrients at the tissue. Addressing this area will also contribute to normalizing gut motility. Treatment was further focused upon the Occipto-atlantal joint where the vagus exits on its course to supply parasympathetic innervation to the upper GI tract. Treating this region should normalize parasympathetic outflow causing a decrease in the amount of gastric acid produced in the stomach and optimizing gut motility. This affect is of great importance in treating GERD.

The patient's response to therapy solidifies the connection between the soma and viscera. Her steady improvement has contributed to increasing patient satisfaction. OMT has contributed to a reduction in the use of pharmaceuticals in this case as well. Clearly OMT is extremely beneficial as adjunctive care in the treatment of GERD.

Conclusion and Summary

The intimate connection between the soma and viscera is the ultimate verification that structure and function are indeed reciprocally interrelated. One hundred years of quality research has proven this connection between somatic dysfunction and visceral pathology. In this case, a 58-year-old professor with severe gastroesophageal reflux reported to the OMT Clinic for chronic back pain in the thoracic region. At her New Patient visit her GERD symptoms required two medications for control. After 14 months of OMT the patient reported improvement of her GERD symptoms. She now requires only one medication to control her GERD symptoms. Therapy focused on somatic dysfunction in the T5-T9 area to address sympathetics to the upper GI tract and the OA joint to address the parasympathetics to the same area.

From the early days of Osteopathy the truth of the viscerosomatic connection has been used to help many patients. The words of prominent early osteopath, Hazzard in his 1899 textbook, *Principles of Osteopathy* say it best:

> "In our treatment of a spine there are two points which we may take into consideration; two objects which we may have in view. In the first place, we may wish to treat the spine itself. In the second place, we may wish to reach, by treating the centers along the spine, the viscera to which these nerves run."[3]

Bibliography

1. Friedman MHF, Hudson WP, and Young GS. "Gastrointestinal reflexes of visceral and somatic origin:" *JAOA*; Vol 78; No 12; August 1979: 903-904
2. Kuchera, W.A., Kuchera, M.L., *Osteopathic Principles in Practice* (2nd edition revised), 1994:6,34
3. Mein, A.E., Richards, D.G., McMillin, D.L., McPartland, J.M., Nelson, C.D., "Physiological Regulation Through Manual Therapy:" *Physical Medicine and Rehabilitation: State of the Art Reviews*; Vol 14; No. 1; Feb 2000: 27-42
4. Robuck, S.V., "The Relation of the Osteopathic Somatic Lesion to Visceral Pathology, The A.D. Becker Memorial Address, 1950:" *JAOA*; Vol. 6; No. 1; Feb 1951:321-324
5. Sato, A.; "The modulation of visceral functions by somatic afferent activity": *Jpn J Physiology*; 1987; 37:1-17.

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AAO Journal Editor,

Happy Birthday Dr. Mitchell!

I recently had the opportunity to direct the Muscle Energy Masters course sponsored by the AAO in Glendale, Arizona. This was the second time that faculty with over 100 years of experience teaching Muscle Energy were gathered to present the evolution of this remarkable approach to osteopathic manipulation. Philip E. Greenman, DO, FAAO and Edward G. Stiles, DO, FAAO had first received a comprehensive tutorial with Fred Mitchell, Sr., DO in 1960. They were joined at AZCOM with Carl Steele, DO who taught with Fred Mitchell, Jr., DO at MSUCOM since 1982. This incredible grouping each taught their approaches in lectures and labs to enthusiastic recipients. I, myself, was amazed at the insights I garnered from having three masters truly collaborating. There was such respect and each attentively took in the other's lecture and then engaged in asking questions and sharing "a-has" as the material sifted through their osteopathic minds.

I thank Dr. Mitchell for the conversation we had when this conference was first discussed. I could not agree with him more that Muscle Energy is one of the great gifts we have to share with the osteopathic profession. Its solid grounding in the biomechanics of the human body, the simplicity of its physiological basis for operation, and the ease in which one can utilize it in clinical situations is extremely valuable. I wish that every DO could have the chance to experience a course like this one just held in November. Minimally, I would recommend that educators-academicians and preceptors alike make the effort to attend CME that enlivens this approach.

I write to honor Dr. Mitchell and congratulate him on his 80th year. His knowledge and generosity will forever guide my hands in caring for my patients.

Osteopathically yours,
Stephanie Waecker, DO

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1. E
2. E
3. A
4. C
5. E
6. B
7. C
8. A
9. A
10. C

September 2008 AAOJ CME quiz answers:

Osteopathic Medicine and the Geriatric Patient

1. D
2. B
3. E
4. A
5. C
6. D

Improvement of L4-L5 disc positioning following treatment with orthotics used to correct gait dysfunction and level the sacral base.

1. D
2. E
3. D
4. C
5. A
6. E

1. Which sequence best describes the Muscle Impulse method?
   A. Position at ease, have the patient push toward the barrier, carry the tissue away from the barrier.
   B. Position at restriction, have the patient push toward the barrier, carry the tissue away from the barrier.
   C. Position at restriction, have the patient push away from the barrier, carry the tissue away from the barrier.
   D. Position at restriction, have the patient push away from the barrier, carry the tissue through the barrier.
   E. Position at ease, have the patient push away from the barrier, carry the tissue through the barrier.

2. Which of the following manipulative methods is/are most similar to Muscle Impulse?
   A. Muscle Energy
   B. HVLA
   C. Still technique
   D. Counterstrain
   E. Both A and B

3. What is the optimum number of impulses initiated by the patient in Muscle Impulse?
   A. 1
   B. 2
   C. 3
   D. 4
   E. 5

4. Which of the following tissues is/are considered targets for the Muscle Impulse technique when there is somatic dysfunction?
   A. Muscle
   B. Tendon
   C. Vertebra
   D. Joints
   E. All of the above
   F. None of the above

5. The Muscle Impulse technique is distinguished from Muscle Energy by
   A. The direction of the patient's effort
   B. The rapidity of the technique
   C. The operator's push into the barrier
   D. The number of efforts the patient makes
   E. The positioning of the patient initially

Answer sheet to December 2008 AAOJ CME quiz will appear in the March 2009 issue.

2008 Journal Index

By Author

By Subject

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