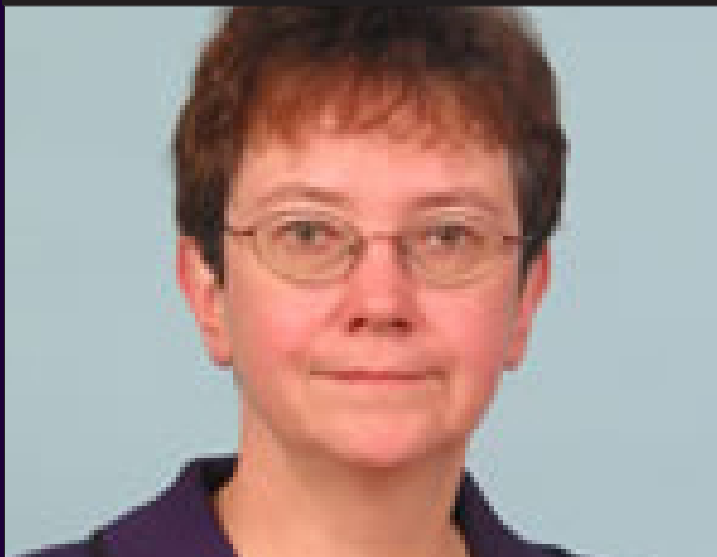


JOURNAL

Official Publication of the American Academy of Osteopathy®

TRADITION SHAPES THE FUTURE

VOLUME 24 NUMBER 1 MARCH 2014



Melicien Tettambel, DO, FAAO, a beloved osteopathic physician specializing in obstetrics and gynecology passed away Sept. 11, 2013. Dr. Tettambel, along with Richard A. Feely, DO, FAAO, FCA, and Melvin R. Friedman, DO, presents the Founder of Osteopathy Award to Viola Frymann, DO, FAAODist, FCA, at the 2011 AAO Convocation in Colorado Springs (top right); Dr. Tettambel with James H. Gronemeyer, DO, and Angelique C. Mizera, DO (bottom left); and with Ray Hruba, DO, and Jim McGovern, PhD, after the Scott Memorial Lecture at Kirksville College of Osteopathic Medicine in 1998 (bottom right).



Osteopathic Manipulative Treatment of Pelvic Dysfunction in a Postpartum Patient with Co-morbid Headaches...pg. 8

The American Academy of Osteopathy® is your voice . . .

...in teaching, advocating, and researching the science, art and philosophy of osteopathic medicine, emphasizing the integration of osteopathic principles, practices and manipulative treatment in patient care.

The AAO Membership Committee invites you to join the American Academy of Osteopathy as a 2013-2014 member. The AAO is your professional organization. It fosters the core principles that led you to choose to become a Doctor of Osteopathy.

For just \$5.01 a week (less than a large specialty coffee at your favorite coffee shop) or just 71 cents a day (less than a bottle of water), you can become a member of the professional specialty organization dedicated to the core principles of your profession!

Your membership dues provide you with:

- A national advocate for osteopathic manipulative medicine (including appropriate reimbursement for OMM services) with osteopathic and allopathic professionals, public policy makers, the media and the public.
 - Referrals of patients through the Search for a Physician tool on the AAO website, as well as calls to the AAO office.
 - Discounts on quality educational programs provided by AAO at its annual convocation and weekend workshops.
 - New online courses.
 - Networking opportunities with your peers.
 - Discounts on publications in the AAO Bookstore.
 - Free subscription to the *AAO Journal* published electronically four times annually.
 - Free subscription to the online *AAO Member Newsletter*.
- Access to the members only section of the AAO website, which will be enhanced in the coming months to include new features such as resource links, a job bank, and much more.
 - Discounts on advertising in AAO publications, on the Web site and at the AAO's Convocation.
 - The American Osteopathic Board of Neuromusculoskeletal Medicine, the only certifying board for manual medicine in the medical world today, accepts, without challenge, all courses sponsored by the AAO.
 - Maintenance of an earned Fellowship program to recognize excellence in the practice of osteopathic manipulative medicine.
 - Promotion of research on the efficacy of osteopathic medicine.
 - Support for the future of the profession through the Student American Academy of Osteopathy on osteopathic medical school campuses.
 - Your professional dues are deductible as a business expense.

If you have any questions regarding membership or membership renewal, please contact Susan Lightle at (317) 879-1881 or slightle@academyofosteopathy.org. Thank you for supporting the American Academy of Osteopathy.



West Virginia School of Osteopathic Medicine Osteopathic Principles and Practices Faculty Position

www.wvsom.edu/employment

Summary: WVSOM is seeking to fill a full-time tenure track faculty position in Osteopathic Principles & Practices (OPP) Medicine. The primary job of this faculty position is to provide education in osteopathic principles and practices and assist in providing OPP integration to all phases of the WVSOM pre and post doctoral curriculum. Research opportunities are available if desired. This position provides an opportunity for a clinical practice. Successful candidates must have a D.O. degree from an accredited college/school of osteopathic medicine and be residency trained and board certified or board eligible by AOBNMM (CSPOMM and/or NMM) or other osteopathic specialty board. The successful candidate must also be eligible for licensure in the state of West Virginia.

Responsibilities: OPP Department duties include training first- and second-year medical students in the classroom. Academic responsibilities may include preparing and delivering lectures, instruction in OPP labs, development of test questions and small group activities. Research is supported and encouraged but not required.

Benefits: Salary and faculty rank will be commensurate with experience and includes an excellent benefits package including medical malpractice insurance, educational loan reimbursement and relocation expenses.

*For the last three years, WVSOM has been consistently recognized as **A Great College to Work For** by the Chronicle of Higher Education. The school's campus is located in Lewisburg, West Virginia a picturesque community nestled in the Appalachian Mountains. In addition to being named America's Coolest Small Town in 2011, Lewisburg has an array of eclectic restaurants, outdoor activities, antique shops, art galleries, a Carnegie Hall performing art center, and a live equity theater that is supported by varied local artists and benefactors. The community is also supported by a regional medical center and excellent educational opportunities for students of all ages. To get a glimpse of this charming community, please visit www.greenbrierwv.com*

Interest candidates should contact Leslie Bicksler, Associate Vice President of Human Resources at 304.647.6279; 800.356.7836; or lbicksler@osteo.wvsom.edu
WVSOM is an equal opportunity employer. Applications accepted until the position is filled.



American Academy of Osteopathy®

3500 DePauw Boulevard, Ste. 1100
 Indianapolis, IN 46268
 Phone: (317) 879-1881 • Fax: (317) 879-0563
 www.academyofosteopathy.org

American Academy of Osteopathy®

David Coffey, DO, FAAO.....President
 Kenneth J. Lossing, DO.....President-Elect
 Diana L. Finley, CMP..... Executive Director

Editorial Advisory Board

Denise K. Burns, DO, FAAO	Brian E. Kaufman, DO
Eric J. Dolgin, DO	Hollis H. King, DO, PhD,
Claire M. Galin, DO	FAAO
William J. Garrity, DO	David C. Mason, DO
Stephen I. Goldman, DO,	Kate McCaffrey, DO
FAAO	Paul R. Rennie, DO, FAAO
Stefan L. J. Hagopian, DO,	Hallie J. Robbins, DO
FAAO	Mark E. Rosen, DO
Raymond J. Hruby, DO, MS,	Katherine A. Worden, DO,
FAAO	MS

The AAO Journal

Kate McCaffrey, DO.....Scientific Editor
 Katherine A. Worden, DO, MS.....Associate Editor
 Diana L. Finley, CMP.....Supervising Editor
 Lauren Good.....Managing Editor

The AAO Journal is the official publication of the American Academy of Osteopathy®. Issues are published in March, June, September and December each year.

The AAO Journal is not responsible for statements made by any contributor. Although all advertising is expected to conform to ethical medical standards, acceptance does not imply endorsement by this journal.

Opinions expressed in *The AAO Journal* are those of the authors and do not necessarily reflect viewpoints of the editors or official policy of the American Academy of Osteopathy® or the institutions with which the authors are affiliated, unless specified.

Please send email address changes to:
slightle@academyofosteopathy.org.

2014 Advertising Rates			
	Placed 1 time	Placed 2 times	Placed 4 times
Full Page 7.5" x 10"	\$600	\$570	\$540
Half Page 7.5" x 5"	\$400	\$380	\$360
Third Page 7.5" x 3.3"	\$300	\$285	\$270
Quarter Page 3.75" x 5"	\$200	\$190	\$180
Classified	\$1.00 per seven characters		

THE AAO FORUM FOR OSTEOPATHIC THOUGHT

JOURNAL

Official Publication of the American Academy of Osteopathy

TRADITION SHAPES THE FUTURE • VOLUME 24 NUMBER 1 • MARCH 2014

The mission of the American Academy of Osteopathy® is to teach, advocate and research the science, art and philosophy of osteopathic medicine, emphasizing the integration of osteopathic principles, practices and manipulative treatment in patient care.

IN THIS ISSUE:

AAO Calendar of Events..... 4
 CME Certification of Home Study Forms..... 29
 Component Society Calendar of Events..... 36

EDITORIALS:

View from the Pyramids.....5
Kate McCaffrey, DO; and Katherine A. Worden, DO, MS
 Not Every Hero Wears a Cape..... 6
Raymond J. Hruby, DO, MS, FAAO

BOOK REVIEW:

Healing Pain and Injury, by Maud Nerman,
 DO, CSPOMM, CA.....5
Anthony G. Chila, DO, FAAODist., FCA

ORIGINAL CONTRIBUTION:

The Bioenergetic Model in Osteopathic Diagnosis and
 Treatment: An FAAO Thesis, Part 1.....12
Jan T. Hendryx, DO, FAAO
 Abstract: Second-year Osteopathic Student Evaluation of the
 Prevalence of a Positive Thomas Test and a Psoas Tender Point
 Before and After Treatment with Counterstrain Technique . 21
*Jocelyn Young, OMS III; Sheldon C. Yao, DO; Reem Abu-
 Sbaith, DO; and To Shan Li, DO*
 Abstract: Usefulness of Video Learning for Osteopathic
 Manipulative Medicine Techniques in the Classroom and
 Clinical Setting30
*Melissa Meghpara, OMS III; Sheldon C. Yao, DO; Theodore B.
 Flaum, DO; Elizabeth Caron, DO; and Michael J. Terzella, DO*
 Osteopathic Manipulative in the Treatment of Primary
 Nocturnal Enuresis: A Retrospective Chart Review 32
David M. Kanze, DO; and Kylie A. Kanze, DO

CASE STUDY:

Osteopathic Manipulative Treatment of Pelvic Dysfunction in a
 Postpartum Patient with Co-Morbid Headaches 8
*Rebecca Kant, OMS III; and Murray R. Berkowitz, DO, MA,
 MS, MPH*
 Resolution of Post-traumatic Temporomandibular Joint Pain,
 Headache and Vision Changes with OMM in the Unified
 Field.....22
*James A. Lipton, DO, CSP-OMM, FAAO, FAAPMR,
 DAOBPMR; and ENS Matthew G. Case, MC, USNR, MS IV*

Advertising rates for *The AAO Journal*, official publication of the American Academy of Osteopathy® (AAO). AAO and American Osteopathic Association affiliate organizations and members of the Academy are entitled to a 20 percent discount on advertising in this journal. Call the AAO at (317) 879-1881 for more information. Subscriptions: \$60.00 per year.

Mark your calendar for these upcoming Academy meetings and educational courses.

All times local.

2014

- March 15-18** *New Approach to Osteo-Articular Manipulations Including the Superior and Inferior Limbs (Pre-Convo)*, Jean-Pierre Barral, DO (France); Kenneth J. Lossing, DO—The Broadmoor, Colorado Springs, CO
- March 17-18** *Osteopathic Approach to Common ENT Complaints of Childhood (Pre-Convo)*—Heather P. Ferrill, DO, The Broadmoor, Colorado Springs, CO
- March 17-18** *Fascial Distortion Model (Pre-Convo)*—Todd A. Capistrant, DO, The Broadmoor, Colorado Springs, CO
- March 18** COFAAO Meeting—The Broadmoor, Colorado Springs, CO
- March 19** Board of Trustees Meeting—8:00 am, The Broadmoor, Colorado Springs, CO
- March 19** Board of Governors Meeting—1:00 pm, The Broadmoor, Colorado Springs, CO
- March 19-23** AAO Convocation—*Trauma: An Integrated Osteopathic Approach*
Denise K. Burns, DO, FAAO, Program Chair—The Broadmoor, Colorado Springs, CO
- March 20** AAO Business Meeting of the Membership—12:00 pm, The Broadmoor, Colorado Springs, CO
- May 30-June 1** **CANCELLED**—*Muscle Energy with Sally Sutton, DO, FAAO*—Richard G. Schuster, DO—MUCOM, Indianapolis, IN
- June 13-15** *Sports Osteopathy*—Kurt P. Heinking, DO, FAAO—CCOM, Downers Grove, IL
- July 18-19** *Ultrasound-Guided Injections*—Sajid A. Surve, DO—UNTHSC-TCOM, Fort Worth, TX

Sutherland Cranial Teaching Foundation Upcoming Courses



SCTF Basic Course:

Osteopathy in the Cranial Field

June 6–10, 2014

Portland, Oregon

Course Director: Dr. Duncan Soule

40 hrs 1A CME anticipated

At The Double Tree Hotel at the Lloyd Center

1000 NE Multnomah

Portland, Oregon

*direct link from the airport to the hotel via the
Max Light Rail Line*

2 restaurants and a fitness center available

Visit our website for enrollment

forms and course details: www.sctf.com

Contact: Joy Cunningham 509-758-8090

Email: jcunningham4715@yahoo.com



View from the Pyramids

Kate McCaffrey, DO; and Katherine A. Worden, DO, MS

As we look forward to spring and an osteopathic homecoming at the Broadmoor for Convocation, let us note some of the highlights. The theme for the meeting is “Trauma: An Integrative Osteopathic Approach,” chaired by Denise Burns, DO, FAAO. Trauma, whether acute or chronic, physical or emotional, is always a consideration as osteopathic physicians provide treatment to our patients. We have some familiar faces and some new faces stepping up to provide lectures and hands-on lab sessions on various facets of this jewel. There will be some international presenters such as Jean Marie A.T. Beuckels, DO, FSc (Hons.) Osteo. Med., Msc. Ost. On this side of the pond, Anthony Capobianco, DO, has stepped in to cover obstetrical trauma after the loss of Dr. Tettambel. Don't forget to stop by and view the OMM Research Posters, and please consider attending the new LBORC-sponsored Research Forum Friday afternoon. There are a growing number of pre-Convocation courses: New Approach to Upper and Lower Extremities; ENT Complaints in Children; and Fascial Distortion Model, for those wanting to “Dig On” further. The concurrent SAAO program for students continues to be a huge success for passing on our osteopathic hands and hearts to the next generation thanks to many of you who have volunteered your time and talents. We look forward to renewing old friendships and making new ones. We look forward to seeing you in Colorado!

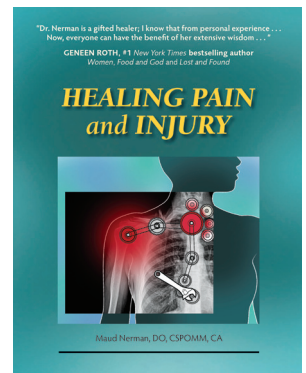
Book Review—Healing Pain and Injury, by Maud Nerman, DO, CSPOMM, CA

Copyright © 2014 Bay Tree Publishing

Anthony G. Chila, DO, FAAO Dist., FCA

Trauma, as encountered in human experience, is reflected in many ways in the body. Despite best intention, resolution is often elusive through conventional medical, as well as alternative, approaches. The passage of time serves only to more deeply encode the garbled transmission of abnormal messages throughout the body's tissues. Dr. Nerman, an osteopathic physician, has done a masterful job of providing perspective and patient-centered orientation necessary to achieve alleviation for suffering patients. Seen in the traditional view of osteopathic medical practice, it is small wonder that she has been so successful. More importantly, Dr. Nerman, throughout the text, clearly demonstrates understanding and applicability of scientific knowledge in the management of the clinical situation. This is accomplished through the use of language which is digestible for the patient. It can only be wished that medical practice in general would demonstrate such accommodation.

For patients and practitioners who encounter the many faces of trauma, *Healing Pain and Injury* provides much needed guidance to more compassionate, knowledgeable and successful interaction with the patient's path to recovery.



Not Every Hero Wears a Cape

In Memoriam: Melicien Tettambel, DO, FAAO

Raymond J. Hruby, DO, MS, FAAO

My long-time friend and colleague, Melicien (Mel) Tettambel, DO, FAAO, passed away on September 11, 2013. An energetic person, with a strong passion for the osteopathic profession, Mel achieved an astounding number of accomplishments during her all-too-short lifetime. Among her achievements: board certification in Obstetrics and Gynecology, and also in Neuromusculoskeletal Medicine and Osteopathic Manipulative Medicine; an illustrious teaching career that included teaching at several of our osteopathic colleges, as well as teaching nationally and internationally; Past President of the American Academy of Osteopathy (AAO), President of the Sutherland Cranial Teaching Foundation (SCTF), Fellow in the AAO and Distinguished Fellow in the American College of Osteopathic Obstetricians and Gynecologists; a number of research projects and an impressive list of publications. At the time of her death, she was Professor and Chair of the Department of Osteopathic Principles and Practice, Pacific Northwest University, College of Osteopathic Medicine in Yakima, Washington.

This brief listing of accomplishments barely scratches the surface and does not even remotely do justice to Mel's many achievements; however, rather than continue with this line of discussion, I would like to talk about Mel Tettambel, the person that I knew.

I can't remember exactly when I first met Mel. I don't recall being formally introduced to her, so my best recollection is that we first became acquainted while working together on one or more AAO committees. Somehow it wasn't long before we became great friends, so much that I can't seem to remember a time when I *didn't* know Mel. Having her as a friend and colleague was that comfortable, as though it had always been that way. When I became Chair of the OMM Department at the College of Osteopathic Medicine of the Pacific, I invited Mel on an annual basis to be a visiting professor for our students, and my wife and I would always have her stay as a guest in our home, allowing us to get to know her even better. In recent years Mel returned the favor by inviting me to come to Yakima to teach her

students, and I had the pleasure of staying with her and her husband in their beautiful home.

How should I describe Mel Tettambel? Before I do that, let me tell you that I have always had a fascination with heroes, and one of my favorite things to do is to ask people who their heroes are in life. Personally, I learned a long time ago that one can have literally thousands of heroic figures in his or her life. Heroes are not always famous leaders or celebrities, but rather ordinary everyday people with remarkable characteristics that impress us and make us want to be like them. And no, not every hero wears a cape. Mel Tettambel was certainly a hero to me. She was an intelligent, honest, hard-working and energetic professional who touched many lives, including mine. One didn't have to be around Mel very long at all to realize that she cared deeply about everyone around her: family, friends, colleagues, her students, and especially her patients.

Again, I could go on and on trying to describe my impressions of Mel. I am, however, reminded of the poem "Success," written by Bessie Anderson Stanley (and often erroneously attributed to Robert Louis Stevenson) that I believe sums up in very short order just about everything I could say about Mel Tettambel:

He has achieved success who has lived well, laughed often, and loved much;
Who has gained the respect of intelligent men and the love of little children;
Who has filled his niche and accomplished his task;
Who has left the world better than he found it;
Who has looked for the best in others and given the best he had;
Whose life was an inspiration
Whose memory is a benediction

The world, and all of us who knew her, are better off because Mel Tettambel was in it, and we are all just a little diminished because of her passing. It was a pleasure and an honor to have known such an amazing person. Rest in peace, Mel. Rest in peace.

ULTRASOUND-GUIDED INJECTIONS

July 18–19, 2014 • UNTHSC-TCOM in Fort Worth, TX

Course Description

This course is designed for physicians who are novices at sonographic guidance for injections. Under the direction of physiatrist Sajid Surve, DO, course participants will be introduced to the basic principles of ultrasound, learn proper injection techniques with ultrasound guidance and learn proper billing and coding for this procedure. Cadavers will be available for practice, and table trainers will facilitate a low faculty-to-participant ratio. The course will focus on the injection of the major joints: glenohumeral, sacroiliac, hip and knee.

Course Objectives

Upon completion of this course, participants will be able to:

- apply the basic principles of musculoskeletal ultrasound;
- comfortably navigate the necessary equipment required for sonographic guidance of injections;
- utilize proper injection techniques under sonographic guidance for the glenohumeral, sacroiliac, hip and knee joints;
- bill, code and document correctly for ultrasound-guided injections; and
- avoid common pitfalls associated with the above procedures.

CME

16 hours of AOA Category 1-A credit is anticipated

Course Director

Sajid A. Surve, DO, is a 2005 graduate of the University of Medicine and Dentistry of New Jersey–School of Osteopathic Medicine. After completing a traditional rotating internship at Delaware County Memorial Hospital in Drexel Hill, PA, he became an inaugural resident, and the first Chief Resident, of the Physical Medicine and Rehabilitation residency at Long Beach Medical Center in Long Beach, NY. He joined the faculty of UMDNJ SOM in 2009 and completed an NMM/OMM residency in 2010.



Course Location

University of North Texas Health Science Center
Texas College of Osteopathic Medicine
3500 Camp Bowie Blvd.
Fort Worth, TX 76107

Course Times

Friday and Saturday: **8:00 am - 5:30 pm**
Breakfast/lunch provided. Please contact Sherrie Warner with special dietary needs: (317) 879-1881 or swarner@academyofosteopathy.org.

Travel Arrangements

Contact **Tina Callahan** of Globally Yours Travel at (800) 274-5975 or globallyyourstravel@cox.net.

Registration Form

Ultrasound-Guided Injections July 18–19, 2014

Name: _____ AOA#: _____

Nickname for Badge: _____

Street Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

E-mail: _____

By releasing your fax/e-mail, you have given the AAO permission to send marketing information regarding courses to your fax or email.

Click here to view the [AAO's Cancellation and Refund Policy](#).

*Registration Rates

	<u>On or before June 18</u>	<u>After June 18</u>
--	-----------------------------	----------------------

AAO Member	\$ 1500.00	\$ 1600.00
------------	------------	------------

AAO Non-Member	\$ 1600.00	\$ 1700.00
----------------	------------	------------

The AAO accepts check, Visa, Mastercard or Discover payments in U.S. dollars

Credit Card #: _____

Cardholder's Name: _____

Expiration Date: _____ 3-digit CVV# _____

Billing Address (if different): _____

I hereby authorize the American Academy of Osteopathy® to charge the above credit card for the full course registration amount.

Signature: _____



Please submit registration form and payment via mail to the American Academy of Osteopathy,®
3500 DePauw Blvd., Suite 1100, Indianapolis, IN 46268 or by fax to (317) 879-0563.
Or register online at www.academyofosteopathy.org.



Osteopathic Manipulative Treatment of Pelvic Dysfunction in a Postpartum Patient with Co-Morbid Headaches: A Case Report

Rebecca Kant, OMS III; and Murray R. Berkowitz, DO, MA, MS, MPH

Abstract

Sciatica is a common chief complaint addressed by medical professionals in today's society and can prove to be extremely debilitating if left untreated. The musculoskeletal changes seen in pregnancy can often lead to an exacerbation or recurrence of this condition. Osteopathic manipulative treatment (OMT) can provide an additional method of managing these symptoms by treating somatic dysfunctions that persist into the postpartum period. A 28-year-old female three months postpartum was seen in our clinic for recurrent right hip pain, right-sided sciatica and chronic headaches. Using osteopathic manipulative techniques, the patient's somatic dysfunctions were removed and her symptoms immediately resolved post-treatment. Although initially successful, the patient returned to the clinic 11 days later reporting a recurrence of her symptoms and was again treated with osteopathic manipulative treatment. This case study examines the persistence of somatic dysfunction into the postpartum period and the benefits of taking an osteopathic manipulative approach toward resolving the symptoms of sciatica in this specific population.

Introduction and Epidemiology

A common chief complaint addressed in today's society by a variety of physicians, sciatica can be extremely debilitating and can drastically alter an individual's quality of life. Sciatica is a symptom rather than a condition by itself. It is defined as "pain, tingling, or numbness in the back, hip, or leg caused by compression or injury to the sciatic nerve."¹ The pain experienced by individuals with sciatica is often sharp, shooting and confined to one leg. It can be exacerbated by even the slightest activity, including sneezing or coughing too forcefully, or even by sitting the wrong way. This symptom is most commonly due to degeneration or displacement of an intervertebral disc leading to compression on a spinal nerve root; however, there can be multiple possible etiologies.²

Sciatica, and low back pain in general, are among the most common complaints of pregnancy, with 50-80% of

women reporting experiencing some type of low back pain during pregnancy.³ During the nine months prior to delivery, a female undergoes both gravity-induced and hormonal changes that alter the musculoskeletal dynamic. As the uterus and fetus enlarge, a center of gravity change forces the female to compensate by leaning backwards. This leads to an increase in lumbar lordosis and, in turn, causes a compensatory increase in thoracic kyphosis. These slight adjustments tend to open up the facet joints, creating a higher degree of instability.⁴ Alongside these changes, hormonal influence also contributes to the structural alterations seen in pregnancy. The hormone relaxin, produced by the corpus luteum, is first expressed around the tenth or twelfth week. Appropriately named, this hormone tends to soften and "relax" the ligaments that hold the sacroiliac joints and pubic symphysis in place in preparation for the birth process.³

Often these changes leading up to pregnancy persist through to the postpartum period. This is thought to be attributed to the prolonged amount of time spent in the dorsal lithotomy position throughout delivery. During this period, the sciatic nerve can be stretched and compressed in the gluteal region.⁵ In instances of prolonged labor, constant pressure on the lumbosacral trunk as it crosses the pelvic brim combined with the inability to reposition may greatly contribute to lasting nerve injury.³ In the Wong et al study, "Incidence of postpartum lumbosacral spine and lower extremity nerve injuries," only a 0.92% incidence of new nerve injury was reported following delivery, with nulliparity and a prolonged second stage of labor being the most contributory factors.⁶ However, incidence of a recurrent nerve injury following pregnancy may be higher in those who have pre-existing sciatica or low back pain.

History

The patient is a 28-year-old Caucasian female who presented to the OMM clinic at Philadelphia College of Osteopathic Medicine-Georgia campus complaining of right hip pain, right-sided sciatica and chronic headaches. On her first visit to the clinic, she was three

months postpartum from an induced vaginal delivery of her first child.

The patient has right-side hip pain and sciatica, which presented prior to her pregnancy. Her hip pain is dull and achy while her sciatica pain is sharp and shoots down the back side of her right thigh to her knee. She described this pain as an 8/10, and following ibuprofen as a 5/10. Prior to her pregnancy, the patient went to see a chiropractor regarding this pain, where it was temporarily reduced to 0/10. Following her pregnancy, her sciatica pain has returned to its initial level of 8/10 without medication.

The patient has a long history of migraines preceded by a visual aura she described as “a central bright spot followed by darkness closing in on both sides.” Immediately following this aura, she experiences numbness and aphasia leading up to the migraine. The patient described this pain as sharp and localized to one side of her head. Pain is a 9/10 initially, but is relieved to a 6/10 upon taking Imitrex. She stated that she has experienced two migraines in the past year, one of these episodes being one month prior to her visit. The patient also experiences headaches without an aura, occurring fairly often at approximately two to three times each week. These have been relieved by ibuprofen 400-800mg once per day; however, the patient does not wish to continue taking this daily medication. She has been to see a neurologist regarding these headaches, especially due to the stroke-like characteristics which precede her migraines. Although the possibility of a CVA or TIA has been ruled out successfully, little has been done to significantly decrease the severity or frequency of these episodes.

Other than her hip pain, sciatica and headaches, the patient's only other chronic medical condition is a TMJ dysfunction she has had since childhood. She has had no previous surgeries and has no known drug allergies. Her current medications include prenatal vitamins and an OTC probiotic. She is married, has one child, and works as a pediatric cardiology nurse. She denies the use of tobacco products or illicit drugs, and she drinks only the occasional glass of wine. The patient has a family history of stroke on the maternal side and myocardial infarction on her paternal side. She denies any fever, nausea, vomiting, diarrhea or loss of consciousness. She does have vision changes; however, these occur only as part of the aura preceding her migraines.

Physical Exam

On physical exam, blood pressure was 110/70, pulse was 78, and respiratory rate was 14. The patient was well-groomed and well-developed, alert, awake and

oriented to time, person and place and in no acute distress. Her head was atraumatic and normocephalic. Extraocular muscles were intact and pupils were equally round and reactive to light. Her neck was supple and no lymphadenopathy or thyromegaly were appreciated. Cardiac exam revealed a faint 1/6 murmur loudest at the right second intercostal space, but also appreciated at the left second intercostal space. Rhythm and rate were regular, with no rubs or gallops. Lungs were clear to auscultation bilaterally, with no wheezes, rhonchi or rales. Neurologic exam revealed that CN II-XII were grossly intact, muscle strength was 5/5 all around and deep tendon reflexes were +2 in all areas with a bilateral +3 patellar reflex. Patient had a normal gait and no motor or sensory deficits were appreciated.

The patient's osteopathic structural exam revealed several somatic dysfunctions. Both the sagittal suture and the right occipitomastoid suture were compressed, and there was tenderness at the insertion of the capitis muscle on the right side. Her cervical dysfunctions included OA ER_RS_L, C2-C4 ER_RS_R and C5-C6 NR_LS_L. AA rotation was asymmetric, with 80 degrees of rotation to the left and only 60 degrees of rotation to the right. Thoracic/costal dysfunction included T3-T4 NR_RS_L and a posterior rib 5. In the lumbar region she exhibited an L3-L5 NR_RS_L dysfunction. Standing flexion test was positive followed by a negative lumbosacral spring test and a positive lumbosacral ligament test. Further examination revealed an anteriorly rotated innominate bone on the right.

Treatment

Osteopathic manipulative treatment was performed to treat the somatic dysfunctions found during the physical examination. In the cranial region, the compressed sutures were treated with a sagittal suture decompression and an occipitomastoid suture decompression with a V-spread. Due to the patient's history of chronic headaches, CV4 and vault-hold and frontal lift techniques to treat the SBS were performed to help alleviate potential causes of pain. Counterstrain techniques were used for cranial tenderpoints. Treatment of cervical dysfunctions consisted of soft tissue, muscle energy, counterstrain, Still technique and suboccipital release. Both thoracic and lumbar dysfunctions were treated using muscle energy and HVLA techniques, helping to normalize the spine and increase range of motion. The patient's posterior rib 5 was also treated using muscle energy, decreasing the asymmetry found in this region. Hip and pelvic somatic dysfunctions were addressed using counterstrain, muscle energy and HVLA.

A.T. STILL UNIVERSITY SEEKS OMM FACULTY

ATSU-KCOM has two full-time OMM faculty positions open. Responsibilities include five half days academic and five half days clinical (outpatient and inpatient OMM consultation service). Great opportunity for residents graduating July 2014 or an OMM couple looking to work together in an academic practice. Now is a great time to apply and secure a position for 2014!

Requirements:

- NMM/OMM or CSPOMM Board Certification or Board Eligibility
- Proficiency in both Direct and Indirect OMT Techniques such as HVLA, Muscle Energy, Counterstrain, Cranial, and Balanced Ligamentous Tension
- Able to work as part of a team
- Eligible for Medical License in the State of Missouri

Job Duties:

- Table training OMM skills laboratories
- Coordinating, preparing, and delivering OMM lecture and laboratory didactics
- See OMM patients in outpatient and inpatient settings
- Research opportunities available
- Additional duties as directed by Department Chair or Dean

Additional qualifications recommended:

- Experience with inpatient OMM
- Proficiency in OMM for children, infants and newborns
- Experience in OMM research
- Proficiency with Microsoft Word and PowerPoint

Salary and Benefits

- Competitive salary with clinical incentives
- Full benefit package – health, life, dental, vision, retirement
- Paid sick leave, vacation, and CME money available

Apply online at <http://jobs.atsu.edu/kcom-omm-assistant-associate-professor-2-positions/job/4243133>.

Following treatment, the patient reported decreased tenderness in the cranial region and increased range of motion in the cervical, thoracic and lumbar regions. Hip pain was significantly improved with successful adjustment of the right innominate bone back to its normal position. No sciatica pain was appreciated immediately following the treatment, and the patient reported an overall improvement in her symptoms.

The patient was counseled on stretching at home and increasing her water intake. She was also instructed to take ibuprofen 600-800 mg with food three times daily for five days for pain/inflammation secondary to a treatment reaction beginning within the next 24-48 hours. She was told to call in with progress reports or to call in sooner if she had any other concerns.

The patient returned to the clinic 11 days later due to a recurrence of her symptoms. She described a “tightness” in her right lower back/hip and a feeling that “her right leg felt longer than her left.” Hip pain was characterized as sore and achy with sharp exacerbations with pivoting. Back tightness and pain was described as a 7/10 and more on the right side, but decreased to a 5/10 with cold packs and stretching. She also described having frontal headaches for the three days immediately following her previous treatment. These headaches occurred upon initially waking up in the morning and improved throughout the day. Pain was an 8/10, sharp and localized to the bilateral frontal region of her head. She stated that this pain decreased to a 1/10 with coffee and ibuprofen. She denied having any other headaches besides these three that were immediately post-treatment. The patient also stated that she experienced a “popping” sensation in her right knee four days prior to her return. Pain was at a 9/10 during the “popping” but subsided to a 2/10 feeling of general achiness afterwards. She described continued soreness on the back of her right upper thigh and knee.

On physical exam, the patient was found to have numerous somatic dysfunctions. There was a recurrence in her sagittal suture compression, and her cervical somatic dysfunctions had completely reversed from her previous visit, now exhibiting OA ER_LS_R, C2-C4 ER_LS_L and C5-C6 FR_RS_R. A TMJ click was appreciated on the left, with a concurrent left deviation of her jaw. Thoracic and lumbar dysfunctions included T4-T6 NR_RS_L and L3-L5 ER_RS_R. She had a negative standing flexion test, positive seated flexion test on the left, and positive lumbosacral spring test. She had a right innominate outflare, with her ASIS, patella and malleolus on the right superior to the left and her ILA on the left posterior and inferior. She also exhibited a tender pubic symphysis and right piriformis. Hamstrings were tight bilaterally.

Osteopathic manipulative treatment was used to address these somatic dysfunctions, treating cranial with a sagittal suture decompression and frontal lift, cervical with soft tissue, counterstrain and Still techniques, thoracic with HVLA, and lumbar with muscle energy. Hip and pelvic dysfunctions were treated using an articulatory technique with valsalva assist in order to spread the ischial tuberosities. Pubic gapping muscle energy and sacral rock techniques were also used. Tightness in both hamstrings and in the right piriformis was addressed using muscle energy, and TMJ dysfunction was treated using an HVLA technique. Immediately following these treatments, the patient reported a significant decrease in tenderness and an increase in range of motion. She was again instructed to increase her water intake and to do gentle stretching at home and

counseled on the possibility of a treatment reaction similar to her first visit. The patient was told to call in after three days and then after the weekend to give progress reports on her symptoms.

Discussion

The patient's presentation of varied somatic dysfunctions are likely a persistence of musculoskeletal changes that occurred during pregnancy. Since relaxin levels return to baseline within a few weeks following delivery, it is imperative to treat any structural dysfunctions early postpartum while the ligaments remain in a state of increased relaxation. The multiple hip/pelvic somatic dysfunctions seen in the patient indicate possible persistence of a dysfunction developed during the delivery process. As discussed in Wong et al, nulliparity and prolonged labor are the most significant factors contributing to postpartum dysfunction and continued neural injury.⁶ As our patient was induced and this was her first child, both of these factors may play a role in the explanation of her hip/pelvic presentations.

Consideration of the relationship between the patient's persistent hip/pelvic dysfunctions and concurrent headaches is also significant. In his discussion on craniosacral motion, King explains this concept by describing that the central nervous system, cerebrospinal fluid, dural membranes, cranial bones and sacrum are all intimately connected by a unit known as the primary respiratory mechanism.⁷ The dura mater, along with surrounding the central nervous system, has direct connections to the foramen magnum, C₂, C₃ and S₂. This indicates that, in a reciprocal fashion, movement in the sacral area has a direct link and can influence functions of the cranium and central nervous system. As the sacrum is in close proximity to the hip/pelvis, dysfunctions in this region and the process of childbirth overall can structurally alter normal sacral motion.⁷ Therefore, our patient's postpartum state and multiple hip/pelvic dysfunctions may be contributing to her frequent headaches.

Osteopathic manipulative treatment can be extremely beneficial in restoring normal structure and range of motion during both pregnancy and the postpartum period. Daly et al researched sacroiliac subluxation as a common cause of low back pain in pregnancy and reported that "after manipulative therapy, 91% had relief of pain and no longer exhibited signs of sacroiliac subluxation."⁸ Another study, conducted by Licciardone et al in 2010 and published in the *American Journal of Obstetrics and Gynecology*, examined the potential benefit of using osteopathic manipulative treatment during pregnancy. This study shows that

back pain decreased and back-specific functioning deteriorated significantly less in the groups treated with osteopathic manipulative treatment alongside routine obstetric care.⁹ Smallwood et al reported the use and effectiveness of OMT in reducing pain during delivery.¹⁰ Although these studies demonstrate that osteopathic manipulative treatment can be advantageous in diminishing low back pain during pregnancy and also during the delivery itself, further research is needed to fully examine the benefits of osteopathic techniques when specifically focusing on the postpartum period.

References

1. A.D.A.M. Medical Encyclopedia [Internet]. Atlanta (GA): A.D.A.M., Inc.; ©2013. Sciatica; [updated 2013 April 16]. Available from: <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001706/>
2. Katz, JN. Getting a leg up on sciatica. *Harvard Health Publications*. February 3, 2009. http://www.health.harvard.edu/healthbeat/HEALTHbeat_020309.htm#arti
3. Al-Khodairy AW, Bovay P, Gobelet C. Sciatica in the female patient: anatomical considerations, aetiology and review of the literature. *Eur Spine J*. 2007;16:721-731. doi: 10.1007/s00586-006-0074-3.
4. Kuchera, ML. Applying osteopathic principles to formulate treatment for patients with chronic pain. *J Am Osteopath Assoc*. 2007;107(suppl 6): ES28-ES38.
5. McDonald, A. Obstetrical nerve injury. *Perinatal Outreach Program*. 2008; 31(April).
6. Wong CA, Scavone BM, Dugan S. Incidence of postpartum lumbosacral spine and lower extremity nerve injuries. *Obstet Gynecol*. 2003;101(2):279-88.
7. King HH. Osteopathy in the Cranial Field. In Chila AG (Ed.), *Foundations of Osteopathic Medicine (3rd ed.)* Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:728-748.
8. Daly JM, Frame PS, Rapoza PA. Sacroiliac subluxation: a common, treatable cause of low-back pain in pregnancy. *Fam Pract Res J*. 1991;11(2):149-59.
9. Licciardone JC, Buchanan S, Hensel KL. Osteopathic manipulative treatment of back pain and related symptoms during pregnancy: a randomized controlled trial. *Am J Obstet Gynecol*. 2010;202(1):43.e1-8. doi: 10.1016/j.ajog.2009.07.057. Epub 2009 Sep 20.
10. Smallwood CR, Borgerding CJ, Cox MS, Berkowitz MR. Osteopathic manipulative treatment (OMT) during labor facilitates a natural, drug-free childbirth for a primigravida patient: a case report. *International Journal of Osteopathic Medicine*. 2013;16:170-177. Available online at <http://dx.doi.org/10.1016/j.ijosm.2012.10.005>.

Accepted for publication November 2013.

Address correspondence to:

Murray R. Berkowitz, DO, MPH
PCOM/GA – Associate Professor of NMM/OMM
625 Old Peachtree Rd. NW
Suwanee, GA 30024

The Bioenergetic Model in Osteopathic Diagnosis and Treatment: An FAAO Thesis, Part 1

Jan T. Hendryx, DO, FAAO

Abstract

The classic five-model concept of patient functioning, assessment and care is central to current osteopathic principles and practice. These primary models are biomechanical-structural, respiratory-circulatory, neurological, metabolic-nutritional and behavioral-biopsychosocial.

A separate sixth osteopathic bioenergetic model exists that emphasizes the concepts of life force or inherent energy flow within the body, energetic communication with the environment, and tissue biophysical and bioelectrical properties. This model has been minimized in the past, but actually may provide the basis for all others.

Although other healing arts disciplines (e.g., acupuncture, Reiki) utilize the bioenergetic model quite rigorously, the osteopathic profession historically has been resistant to discuss, research or embrace bioenergetics as a plausible explanation for the efficacy of osteopathic manipulative treatment (OMT), or as a contributing etiology of somatic and visceral dysfunction and health and disease.

This thesis will review the classic five models and osteopathic bioenergetic model; explore bioenergetic properties of living systems in an attempt to offer explanations behind the palpatory experiences and therapeutic results of OMT; discuss two bioenergetically-based OMT techniques; explore an expanded osteopathic bioenergetic model and discuss why the bioenergetic model should be utilized regularly in patient diagnosis and care; and offer suggestions for osteopathic research into possible bioenergetic contributions to the causes and maintenance of somatic and visceral dysfunctions.

Literature Review

The Five Osteopathic Models

In the early 1980s, the Educational Council on Osteopathic Principles (ECOP) developed five conceptual models related to patient assessment,

functioning, and care:^{1,2} biomechanical-structural, respiratory-circulatory, neurological, metabolic-nutritional and behavioral-biopsychosocial. These models are supported by principles of anatomy, physiology, biochemistry and psychiatry/psychology. Each model provides a lens through which the patient can be viewed, diagnosed and treated. These models are not typically utilized in isolation but have various degrees of overlap with the others.

The neuromusculoskeletal system is considered the core interface among the models that helps to integrate and coordinate basic body functions, while playing a primary role in a patient's ability to adapt to multiple stressors (e.g., trauma, infection, nutritional, social) and maintain health.¹ (See Figure 1)

The *biomechanical-structural model* views the patient primarily from a structural perspective. It emphasizes the anatomy of the muscles, spine and extremities and resultant functions of posture and motion. Osteopathic manipulative treatment (OMT) is directed toward normalizing biomechanical somatic dysfunctions (joints, myofascia), thus restoring normal structural integrity, physiological functioning, adaptive potential and homeostasis.¹ Osteopathic manipulative techniques commonly utilized to normalize biomechanics include high-velocity low amplitude thrusting, muscle energy, counterstrain, ligamentous articular strain, myofascial release,² facilitated positional release³ and Still technique.⁴

The *respiratory-circulatory model* emphasizes normalization of a patient's pulmonary and cardiovascular functions, and the circulation of fluids (blood, lymph, cerebrospinal fluid).² Horizontal diaphragms (tentorium cerebelli, respiratory, pelvic), thoracic inlet, thoracic cage, extracellular matrix, lymphatics¹ and viscera⁵ (heart, lungs, kidneys) are important anatomical structures addressed. Osteopathy in the cranial field, cervical, thoracic and rib mobilization, lymphatic drainage, respiratory diaphragm myofascial release, and visceral osteopathic manipulative techniques are helpful in restoring health

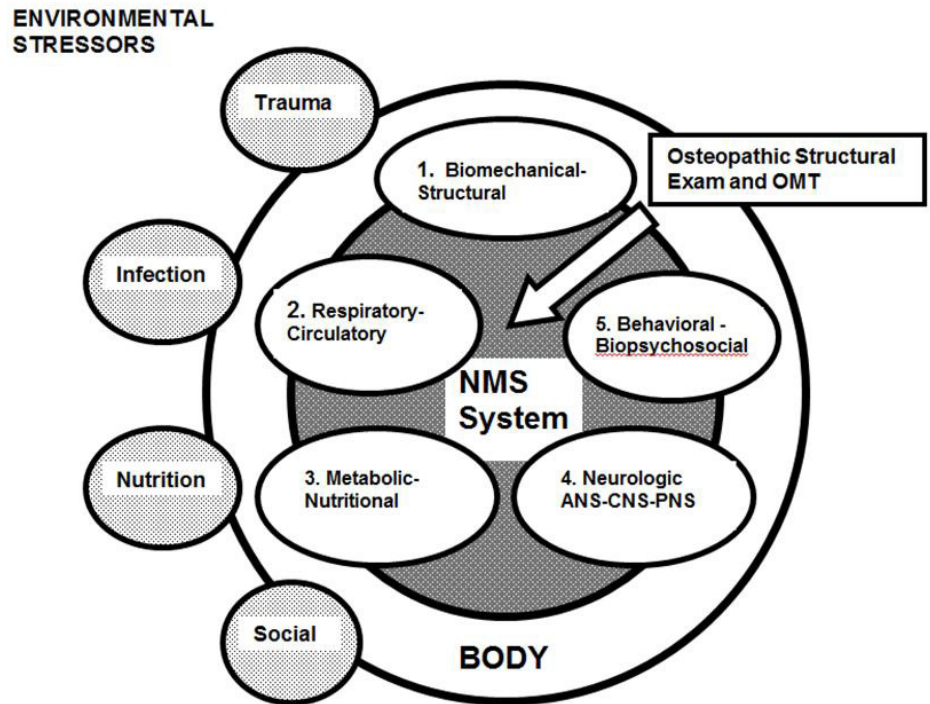
in combination with medications, surgery, intravenous fluids and even ventilation as appropriate.¹

The *metabolic-nutritional model* encourages maximizing the efficiency of the patient's natural self-regulatory and self-healing mechanisms.^{1,2} Homeostatic adaptive responses are orchestrated through positive and negative feedback systems to regulate various forms of energy exchange and conservation that occur through metabolic processes and organ functioning. The neuroendocrine-immune system and all internal organs are the focus. Lifestyle changes such as appropriate exercise, nutritional counseling and stress reduction are primary therapeutic modalities, as are appropriate use of medications. Osteopathic manipulative treatment includes lymphatic pump and visceral techniques.^{1,2}

The *neurological model* addresses aberrations in the peripheral, autonomic and central nervous systems that may cause pain and dysfunction. These elements control, coordinate and integrate body functions.¹ Proprioceptive reflex and muscle strength imbalances,⁶ spinal segmental facilitation,^{7,8} nerve compression and entrapment disorders, autonomic reflexes and visceral dysfunctions,⁸ nociceptive influences⁹ and brain dysfunctions¹⁰ are common problems. Manipulative treatment may include osteopathy in the cranial field,¹¹ Chapman reflexes, rib raising, counterstrain, muscle energy, neural release¹² and inhibition.⁹ Exercise therapy, including proprioceptive balance training, stretching and strengthening,⁶ as well as appropriate neurological evaluation, referral, surgery and medications may be appropriate in patient management.

The *behavioral-psycho-social model* addresses a patient's mental, emotional, social and, to some degree, spiritual dimensions in relationship to health and disease.^{1,2} Mind-body interactions can have a huge influence on a patient's wellbeing and functioning in society. Depression, anxiety, stress, habits, addictions and numerous other conditions must be addressed appropriately, often in conjunction with medications, psychiatry or psychotherapies, stress reduction, meditation, and support groups. Osteopathic

Figure 1. Classic five models of physiological function coordinated and affected by the neuromusculoskeletal (NMS) system and adapting to external and internal environmental stressors. Osteopathic diagnosis and manipulative treatment is seen as a key modality to help restore homeostasis and facilitate health. (Adapted from *Foundations of Osteopathic Medicine*, 3rd edition¹)



manipulative treatment also may be helpful in the form of somatoemotional release with guided imagery¹³ and emotional release.¹⁴

The Bioenergetic Model in Osteopathic Medicine

Healers in various cultures have utilized bioenergetic models of healing throughout the millennia. Oriental medicine, for example, which originated in China at least 5,000 years ago, describes the concept of qi (ch'i)—energy or life force. Qi is thought to maintain homeostasis and/or cause aberrations in health. In other words, abnormalities in qi (excesses, deficiencies or stagnation) are thought to be the root cause of illness.¹⁵

Throughout the history of the osteopathic profession, numerous manipulative techniques have been developed to treat a variety of patient ailments and assist in maintaining homeostasis. These techniques are primarily based upon biomechanical, neurophysiological or lymphatic/fluid models.¹ Not included in the five classic models above, and rarely discussed both in the medical literature and clinically, is the bioenergetic model. Bioenergetics is, perhaps, the all-encompassing model that underlies the classic five models, as well as life itself.

Bioenergetics is a unique field of research that falls under the category of biophysics, and is not emphasized, per se, as an important part of traditional biology or clinical medicine. It is the study of how endogenous and exogenous energy sources/forms influence and control living systems and their environment. Scientific study of bioenergetics of both plants and animals, including humans, has been prolific and ongoing for at least a century.^{16,17,18,19}

Bioenergetic concepts actually have been a part of the language and practice of osteopathic medicine from the early beginnings. Andrew Taylor Still advertised and practiced as a magnetic healer prior to founding our profession.^{20,21} In his book *The Philosophy and Mechanical Principles of Osteopathy*, he discussed the concept of “biogen”²² as vital (energetic) force operating through protoplasm to produce living matter.²³ He acknowledged that electric and magnetic forces in the body are likely important in health.²⁴

In 1902 J.M. Littlejohn, DO,²⁵ defined the *vital force* as a union of spirit and matter operating through its basic principle—the power of vibration. He noted that oscillatory rhythms exist in all living tissues in one form or another, and surmised that various levels of “vibratility” correlate with normal and abnormal functioning, i.e., health and disease. From his perspective, encouraging restoration of normal vibratory activity in the body was an important physiological principle behind osteopathic therapeutics.

In 1903 Hulett²⁶ presented a detailed osteopathic energy model. He conjectured, “a normal condition of health is dependent on a proper coordination of energies, and that disease represents a state of living matter such that incoordination results.”

Around this same time, W.G. Sutherland was just beginning his lifelong journey to develop the cranial concept, a model for osteopathic treatment in the cranial field. In order to explain rhythmic motions of the cranium, sacrum and other tissues that he was palpating, he eventually (1939) defined what he called the *primary respiratory mechanism* and *potency*.²⁷ The primary respiratory mechanism has five components, two of which may contribute the inherent driving forces behind the flexion-extension phases of movement. These are the inherent motility of the brain and spinal cord; and fluctuation of the cerebrospinal fluid.²⁸

Magoun²⁹ stated that fluctuation of the cerebrospinal fluid exhibited two characteristics which affect the whole body: potency, an energetic force, acting through a hydrodynamic mechanism; and electrical potentials

acting in positive and negative phases. He suggested that electrical energy might be generated by the coiling and uncoiling of the neural tube. Additionally, he wrote, “In the cranial concept, human electrobiology is tremendously affected by its environment as it carries out a similar transmutation throughout the body.”

One of the greatest champions for the bioenergetic model was Robert Fulford, DO. Throughout much of his career, he relied on his understanding of bioenergy to explain his hands-on techniques and use of the percussion hammer.^{30,31,32} He continually questioned and sought answers to the true nature and greater scope of healing and osteopathic principles. He had a wide-ranging interest in research and therapies related to the energetic life force, including polarity therapy.³³

Polarity therapy is an energetically-based system of health, diagnosis and treatment founded upon Eastern traditions (yogic/Ayurvedic and Chinese medicine).³⁴ Developed by Randolph Stone, DO, DC, it addresses mind-body-spirit issues by therapeutically touching the body to (theoretically) affect electromagnetic wave and polarity imbalances.^{35,36}

During the 1960s, Rollin Becker, DO, sought to define, explain and teach about various palpable energies that he experienced while treating patients with osteopathy in the cranial field. In a series of four articles (1964-65)^{37,38,39,40} he described and discussed *bioenergy fields*, *biodynamic* and *biokinetic intrinsic energies* and *forces* and their relationships to potency, fulcrums, diagnostic and therapeutic touch, health, disease and trauma. *Biodynamic intrinsic forces/potencies* were defined as the “physiological energy found in the health within the patient.” *Biokinetic intrinsic forces/potencies* were defined as the “pathological-physiological energies... found in disease and traumatic states within the patient.”⁴¹ In 1969, he abandoned these terms and concepts when he perceived they were not being appreciated and understood by colleagues.⁴²

In 1987 Stephen M. Davidson, DO, developed an osteopathic diagnosis and treatment model which he called *neurofascial release*.⁴³ Based on a paradigm of standing waveforms and interference vibratory patterns in tissues, this technique can be applied to musculoskeletal, visceral, cranial and even emotional dysfunctions. Neurofascial release will be discussed in more detail later in this paper.

A similar model of abnormal interference tissue wave patterns is thought to explain the “energy cyst” concept originating with Elmer Green, PhD, and described by MacDonald⁴⁴ and Upledger.⁴⁵ *Energy cysts* are defined as energetically encapsulated areas of the body which

contain increased energy entropy or disorganization within the cysts. Theoretically, these result from physical, mental, emotional or spiritual trauma, and are similar to the concept of stagnant or blocked qi in the acupuncture meridian system. They can be detected by a number of methods and treated by myofascial unwinding of the cyst area with subsequent mobilization of related facilitated spinal segments and the dural tube.⁴⁴

In the late 1980s and early 1990s, Carlisle Holland, DO, pondered the human body from a biophysics standpoint. With a unique educational background in aerospace engineering, molecular biology and osteopathic medicine, he began discussing the colloidal nature of tissues and their propensity to move between solid or gel states. Sol-gel interconversion in colloids occurs when certain energetic or physical stresses are applied. Thus, changes in viscoelastic and viscoplastic properties of the dura (and tissues in general) occur as a result of trauma/dysfunction, and can normalize by appropriate treatment with osteopathy in the cranial field and other techniques.⁴⁶ Holland went on to expand these concepts with dynamical systems theory, chaos theory, and fractal principles.⁴⁷ His contribution to the osteopathic bioenergetics model also will be discussed subsequently.

Also during the 1990s, O'Connell researched and applied bioenergetics and biophysics principles to the treatment of fascia.⁴⁸ She developed the bioelectric fascial activation energy and holographic models for an osteopathic manipulative technique she termed *bioelectric fascial activation and release* (BFAR).⁴⁹ This bioenergetic paradigm supports homeostasis through the synthesis of fascial bioresponsive electrical potentials, continuity and interface with the ECF, compensatory pattern and environmental communication. Treatment is accomplished through holographic palpation and energetic fascial activation.⁴⁸

Over the past decade or so, the interest in bioenergetics in osteopathic medicine appears to have increased. In 2003 Comeaux described a method of diagnosis and treatment he termed *facilitated oscillatory release* (FOR).⁵⁰ The theoretical basis of which is the mechanical facilitation of coherent vibrations in the tissues resulting in normalization of function. He characterizes the technique as a merger of principles from Fulford's percussor model, fascial release and muscle energy.⁵⁰

Other physicians also providing more recent insight and experience to the bioenergetic model include Lee (Spirit/extracellular matrix biophysics),^{51,52} Chikly (trauma vector release),¹⁰ and Hendryx⁵³ and O'Brien

(dynamic strain-vector release).⁵⁴ The contributions of these authors will be discussed in more detail later.

In 1939 C.P. McConnell, DO, wrote, "keep in mind that osteopathic pathogenesis is pre-eminently (essentially fundamental) a field of beginning pathology firmly grounded on biophysics. Herein arises the soundness and comprehensiveness of osteopathic science."⁵⁵

Energy Medicine and the Scientific Basis of the Bioenergetic Model

Energy is defined scientifically as the ability to do work.⁵⁶ The first law of thermodynamics maintains that energy can be neither created nor destroyed. It can only be converted to other forms of energy.⁵⁷

Some familiar forms of energy include kinetic (motion), potential (stored), chemical, electromagnetic, heat, elastic, gravity and sound. Any form of energy can be absorbed by and affect living systems. Living systems also produce energy and interact with each other and the environment through energy exchange.⁵⁸

Energy medicine can be defined simply as the use of energetic principles and phenomena to diagnose and treat patients. Oschman has made the argument, "all medicine is energy medicine and that the energetic perspective holds the key to the future of the entire medical enterprise."⁵⁹ He has thoroughly reviewed the historical background, measurements, biophysics and therapeutic uses of energetic phenomena in medicine (including osteopathic) and human performance.^{58,60} Holland,⁴⁷ Lee,^{16,52} O'Connell,⁶¹ Comeaux,^{30,50} Davidson,⁴³ Hendryx and O'Brien⁵⁴ and Handoll⁶² have expanded and integrated these concepts to explain palpatory findings of inherent body motions, somatic dysfunction and manipulative therapeutics in the osteopathic healing model.

Biophysics and bioenergetic principles are utilized every day in medicine for diagnosis and treatment. Diagnostic instrumentation that employ energetic measurements include X-rays, computerized tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET), electrocardiography (ECG), electroencephalography (EEG), electromyography (EMG), evoked potentials, infrared thermographic imaging, magnetoencephalography (MEG), magnetocardiography (MCG), ultrasound (US), superconducting quantum interference device (SQUID) magnetometry (biomagnetometry), pulse oximetry and skin surface potential measuring devices.

"Conventional" treatment modalities that utilize various forms of energy include ultrasound, electrical stimulation, electric/magnetic bone stimulation,

diathermy, X-irradiation, gamma-irradiation, light therapy (full spectrum, ultraviolet, laser, infrared), electrocautery, pacemaker, defibrillator, neurofeedback and music therapy. Osteopathic manipulative treatments of various types utilize mechanical energy, at the least.

The National Center for Complementary and Alternative Medicine (NCCAM/NIH) has designated and is supporting research into eight categories of complementary and alternative medicine:⁶³

1. Alternative systems
2. Botanicals/herbal medicines
3. Biofield therapies (energy medicine/ bioelectromagnetics)
4. Manipulative/manual/therapeutic bodywork
5. Movement therapies
6. Mind-body interactions
7. Pharmacologic/biologic
8. Diet/nutrition/lifestyle changes

Categories three and four obviously apply to the central theme of this thesis. At this point, it is important to define various terms related to the bioenergetic model as these terms do not appear in conventional osteopathic resource literature.

Beverly Rubik, PhD, has defined the *biofield* as “the complex, extremely weak electromagnetic field of the organism hypothesized to involve electromagnetic bioinformation for regulating homeodynamics.”⁶⁴ The

biofield has been measured by a number of devices⁵⁸ and is concentrated within and immediately surrounds the physical body, although its boundaries are limitless. All cells, organs, organ systems and the extracellular matrix contribute energy to the biofield, with the heart and brain producing the two largest effects, respectively.^{58,60} *Biofield therapy* can be defined as any therapeutic modality which interacts and changes the biofield and its manifestations.⁶⁴

Bioenergy is energy produced endogenously by living systems.^{58,60} The nature and sources of bioenergy are known in some instances, unknown in others. Much of it appears to manifest in the electromagnetic spectrum from extra low frequency fields (ELF) (<100 Hz) through 10¹⁵ Hz (visible light).⁵⁸ Bioenergy is created and transmitted by a number of bioelectromagnetic and physiological activities inside living tissues and cells. Sources of bioenergy include biochemical reactions, ion influx/efflux through membranes (gating mechanisms), piezoelectric phenomena, mechanotransduction, electrical conduction through the neuromusculoskeletal system, blood circulation and electromechanical activity of the heart.^{58,60} Some unknown sources and types of bioenergy have to do with inherent motion of the craniosacral system (cranial rhythmic impulse) and primary respiratory mechanism, acupuncture meridian systems, qi, healing biofields, and subtle energy.^{60,65} Biofield energies may be directed and controlled through consciousness and intention.^{60,66}

CLASSIFIED ADVERTISEMENTS

SEEKING OMM SPECIALISTS IN SAN FRANCISCO AND NEW YORK CITY

Innovative primary care practice seeks full-time OMM Physician. Balanced lifestyle, work with academically trained MDs, started by original designer of Epocrates. Opportunities in San Francisco and New York City. If interested, please send a brief intro and CV to ermoses@onemedical.com or visit www.onemedical.com/jobs.

NMM PLUS 1 POSITIONS AVAILABLE IN SUNNY SOUTH FLORIDA

Residency program at Larkin Hospital. Contact Joel D. Stein, DO, FAAO, at (954) 563-2707 or ommdoc@aol.com for more information.

NMM PLUS 1 RESIDENCY PROGRAM IN NEW YORK

NMM Plus 1 Residency at Southampton Hospital in beautiful Southampton, Long Island. Applications are currently being accepted. If interested, please contact Program Director Denise K. Burns, DO, FAAO, at drdenise@optonline.net or Education Department Secretary Karen Roberts at (631) 726-0409.

GROWING FL PRACTICE SEEKS FP/DO/DERMATOLOGIST

Reliant Family Practice in Gainesville, FL, seeks specialist in Family Practice/ OMM and/or Family Practice/ Dermatology for its growing, close-knit, supportive practice under the

direction of Erik Schabert, DO. Call Mika Harris, Office Manager, for first contact at (352) 514-6452 or email mika@reliantfamilypractice.com.

PRACTICE OSTEOPATHY IN BEAUTIFUL COLORADO

Successful integrative practice seeks a board-certified/eligible NMM/ OMM physician for its busy Denver office. Preferably someone comfortable with a broad variety of techniques. Very competitive compensation. Friendly and professional atmosphere. Please call (303) 781-7862 or e-mail CV to mgentile@cointegrative.com. Our Web site is www.cointegrative.com.

Bioelectromagnetics is the study of the interaction between electromagnetic fields and biological living systems. *Bioelectromagnetism* describes the inherent ability of living cells, tissues and organisms to produce and emit electrical and magnetic fields, and the response of cells to electromagnetic fields.⁶⁰

Oschman considers the human body to be a tissue-tensegrity piezoelectric matrix or liquid crystal under tension.⁶⁰ From a biophysics standpoint, this characteristic allows the body to react to and create various frequencies and fields of energy. The human body also creates other forms of energy including heat, sonic, photic (light/photons), chemical and mechanical.⁶⁰

The Bioenergetic Nature of Somatic Dysfunction

To an osteopathic physician, thorough evaluation of the neuromusculoskeletal system is key in accurately diagnosing and appropriately treating a patient. Intelligent palpation of changes in the position, motion, texture, tension and temperature of tissues gives important clues as to the status of a patient and response to treatment. Abnormal tissue texture changes, asymmetry and restriction of motion, and tenderness (i.e., T.A.R.T.) are the hallmarks of somatic dysfunction. *Somatic dysfunction* is classically defined as “impaired or altered function of related components of the somatic (body framework) system; skeletal, arthrodiagonal and myofascial structures, and the related vascular, lymphatic and neural elements.”⁶⁷ Commonly considered underlying etiologies of somatic dysfunction include poor body mechanics and posture, muscle imbalances, abnormal neurological reflexes, facilitation, emotional stressors, compensation from other areas of body or visceral dysfunctions, leg length discrepancies, localized strains and sprains, response to trauma and pain and others.⁶⁸ Abnormal tissue texture changes palpated in tissues are generally assumed to be maintained by various reflexes in the neuromusculoskeletal system and also by biotensegrity abnormalities.^{68,69}

Because of the energetic nature of living systems, several important questions arise. Can energetic dysfunctions in the body or biofield cause or contribute to somatic dysfunction and other health issues? If so, how might these manifest? Can bioenergetic osteopathic manipulative techniques be utilized to actually treat somatic, visceral or psychological dysfunctions? What are the energetic mechanisms behind these techniques?

Energetic phenomena in the body that can be palpated and used in treatment of somatic or visceral

dysfunctions and psychosomatic conditions have been previously described and reviewed in depth.⁵⁴ These include palpation of inherent motions (nervous system, cranial rhythmic impulse/primary respiratory mechanism, visceral, myofascial), still points, therapeutic pulses, thermal projections, vibratory fields, biodynamic and biokinetic energy fields, “energy cysts,” “listening,” fascial interference patterns, pathological strain-vectors⁵⁴ and head trauma vectors.¹⁰ Osteopathic manipulative techniques that employ primarily a bioenergetic model in treatment include, but are not limited to, Fulford percussor treatment,³² myofascial release,⁶¹ bioelectric fascial activation and release,⁴⁹ neurofascial release,⁴³ dynamic strain-vector release,⁵⁴ lymphofascial release⁷⁰ and head trauma vector release.¹⁰

Holland⁷¹ makes a compelling argument for a biophysics and mathematically based system of integrative medicine which he terms “Dynamical Medicine.” Dynamical medicine follows a mathematical model and is named for its origin in dynamical systems theory, a branch of science concerned with chaos and fractals. Dynamical systems theory applies to all living systems in all dimensions and describes biological shapes and processes mathematically.

Physiological functioning in a dynamic living system is complex, and various parameters (blood pressure, blood chemistries and cell counts, heart and respiratory rates, body temperature, etc.), tend to hover within certain “normal ranges,” but never remain fixed. The domains of fluctuating parameter values were given the name of “strange attractors” by Lorenz.⁷¹

Through the lens of dynamical medicine, the human being is seen as an energetic vibrating system exhibiting fractal geometry in all dimensions. *Fractals* are mathematical processes that exhibit repeating patterns (waveforms) and occur in all of nature.^{71,72} In humans, fractals may be seen in the branching patterns of nerves, blood vessels, lymphatics, fascia, muscles, ligaments, bones and in the tissue organization of all organs in the body. In normal tissue, energy flows unhindered through the fractal system, and normal function ensues (i.e., strange attraction). In dysfunctional systems, energy flow through fractals is blocked. Blockage occurs at what is known as a “catastrophic bifurcation” of the fractal where the waveform collapses.⁷¹

The point where this catastrophic bifurcation emerges is mathematically known as a “point attractor.” Point attractors may be “trivial” or “non-trivial.” Trivial point attractors are reversible in their stressor effects on a system. The living system can revert back to normal

functioning with full fractal expression once the trivial point attractor is removed.⁷¹ Holland has described somatic dysfunction as a “matted fractal” where the energy flow is interrupted.⁴⁷ Thus, reversible somatic dysfunction is an example of a trivial point attractor in the dynamical medicine model.⁷¹

Non-trivial point attractors result in irreversible changes in the system. These produce permanent blocks in the energy flow and communication in the system and, if severe enough, will cause total collapse of the energy flow and fractal geometry of the system and death. Examples might include a cerebrovascular accident, fatal cardiac arrhythmia, liver or kidney failure.⁷¹

Sol-gel interconversions have been postulated to underlie palpatory findings of abnormal tissue texture changes associated with somatic dysfunction.^{54,73,74} Holland emphasizes that all tissues, including the myofascia and extracellular matrix, are colloidal (a non-precipitating suspension) in nature and, as such, must follow colloidal physics principles.⁷¹ Colloids have physical properties of both liquids (sol) and solids (gel), and are able to absorb and store energy through their intermolecular bonds. Physical energy in the form of trauma and even electromagnetic energy and fields (i.e., point attractors) can cause sol-gel interconversions.⁵⁴

Part two of Dr. Hendryx’s thesis will appear in the next issue of the American Academy of Osteopathy Journal.

References

1. Seffinger MA, King HH, Ward RC, et al. Osteopathic Philosophy. In: Chila AG, ed. *Foundations of Osteopathic Medicine*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:3-22.
2. Educational Council on Osteopathic Principles. *Glossary of Osteopathic Terminology*. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine; 2011:5:25-26.
3. Schiowitz S. Facilitated Positional Release. In: DiGiovanna EL, Schiowitz S, Dowling DJ, eds. *An Osteopathic Approach to Diagnosis and Treatment*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2005:89-90.
4. Van Buskirk RL. *The Still Technique Manual*. 1st ed. Indianapolis, IN: American Academy of Osteopathy; 1999:7-87.
5. Lossing K. Visceral Manipulation. In: Chila AG, ed. *Foundations of Osteopathic Medicine*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:845-849.
6. DeStefano LA. Common Clinical Syndromes: Exercise Principles and Prescriptions for the Lower Quarter. *Greenman’s Principles of Manual Medicine*. 4th ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:479-485.
7. Korr IM. Proprioceptors and somatic dysfunction. *J Am Osteopath Assoc*. March 1975;74:638-650.
8. Korr IM. The spinal cord as organizer of disease processes: III. Hyperactivity of sympathetic innervation as a common factor in disease. *J Am Osteopath Assoc*. Dec 1979;79(4):232-7.
9. Dowling DJ, Scariati PD. General Physiologic Considerations. In: DiGiovanna EL, Schiowitz S, Dowling DJ, eds. *An Osteopathic Approach to Diagnosis and Treatment*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2005:38-52.
10. Chikly B. The Inherent Motility of the Brain and Spinal Cord Part 1: Brain Parenchyma, Nuclei and Fluid., 2010; Philadelphia, PA.
11. Magoun HI. Entrapment Neuropathy in the Cranium. In: Feely RA, ed. *Clinical Cranial Osteopathy: Selected Readings*. Meridian, ID: The Cranial Academy; 1988:184-190.
12. Barral JP. Cranial Nerve Manipulation, 2005; AAO Convocation. Reno, NV.
13. Upledger JE. *SomatoEmotional Release and Beyond*. Palm Beach Gardens, FL: UI Publishing; 1990:1-31.
14. Lossing K. Trauma Emotional Diagnosis and Treatment, 2001; Colorado Springs, CO.
15. Helms JM. *Acupuncture Energetics: A Clinical Approach for Physicians*. Berkeley, CA: Medical Acupuncture Publishers; 1995:19-50.
16. Lee RP. *Interface: Mechanisms of Spirit in Osteopathy*. Portland, OR: Stillness Press; 2005:175-253.
17. Oschman JL. *Energy Medicine: The Scientific Basis*. New York, NY: Churchill Livingstone; 2000:1-40.
18. Oschman JL. *Energy Medicine in Therapeutics and Human Performance*. New York, NY: Butterworth/Heinemann; 2003:1-27.
19. Burr HS. *Blueprint for Immortality: The Electric Patterns of Life*. Great Britain: Neville Spearman Publishers; 1972:1-192.
20. Beck BL. Magnetic healing, spiritualism, and chiropractic: Palmer’s union of methodologies, 1886-1895. *Chiropractic History. The Archives and Journal for the History of Chiropractic*. 1991;11(2):11-15.
21. Clyde H. *Medical History of Wapello County*. Photocopy of writings on Paul Caster’s treatment and mentoring of A.T. Still in magnetic healing. Osteopathic Archives, Kirksville College of Osteopathic Medicine. Kirksville, MO; c. 1898.
22. Still AT. *The Philosophy and Mechanical Principles of Osteopathy*. Kansas City, MO: Hudson-Kimberly Publication Co; 1902:248-268.
23. Lee RP. *Interface: Mechanisms of Spirit in Osteopathy*. Portland, OR: Stillness Press; 2005:35.
24. Still AT. *The Philosophy and Mechanical Principles of Osteopathy*. Kansas City, MO: Hudson-Kimberly Publishing Co; 1902:296-99.
25. Littlejohn JM. The physiologic basis of therapeutic law. *J Am Osteopath Assoc*. 1902;2:42-60.
26. Hulett GD. *A Text Book of the Principles of Osteopathy*. Kirksville, MO: Journal Printing Co; 1903:43-68.
27. Sutherland WG. *The Cranial Bowl*. Mankato, MN: W G Sutherland; 1939:8:24 (Reprinted by the Osteopathic Cranial Association, Meridian, ID, 1948).
28. Magoun HI. *Osteopathy in the Cranial Field*. 2nd ed. Kirksville, MO: Journal Publishing Co; 1966:23-42.
29. Magoun HI. *Osteopathy in the Cranial Field*. 2nd ed. Kirksville, MO: Journal Publishing Co; 1966:25-26.
30. Comeaux Z. The role of vibration or oscillation in the development of osteopathic thought. *AAO Journal*. 2000;10(3):19-24.

31. Fulford, RC with Gene Stone. *Dr. Fulford's Touch of Life*. New York, NY: Pocket Books; 1996:48-49:63-89.
32. Fulford RC. Percussion Vibrator Course, 1989; Huntington, WV.
33. Comeaux Z. *Robert Fulford, D.O. and the Philosopher Physician*. Seattle, WA: Eastland Press; 2002:25-64.
34. Sills F. *The Polarity Process: Energy as a Healing Art*. Longmead, UK: Element Books, Ltd; 1989:1-191.
35. Stone R. *Polarity Therapy: The Complete Collected Works, Vol. 1*. Sebastopol, CA: CRCS Publications; 1986:1-93.
36. Stone R. *Polarity Therapy: The Complete Collected Works, Vol. 2*. Sebastopol, CA: CRCS Publications; 1987:1-52.
37. Becker RE. Diagnostic Touch: Its Principles and Applications Part I: To Feel Living Function. In: Brooks RE, ed. *Life in Motion*. Portland, OR: Rudra Press; 1997:153-165.
38. Becker RE. Diagnostic Touch: Its Principles and Applications Part II: What A Diagnostic Touch Can Do. In: Brooks RE, ed. *Life in Motion*. Portland, OR: Rudra Press; 1997:166-179.
39. Becker RE. Diagnostic Touch: Its Principles and Applications Part III: Putting a Diagnostic Touch to Work. In: Brooks RE, ed. *Life in Motion*. Portland, OR: Rudra Press; 1997:180-202.
40. Becker RE. Diagnostic Touch: Its Principles and Applications Part IV: Trauma and Stress. In: Brooks RE, ed. *Life in Motion*. Portland, OR: Rudra Press; 1997:203-216.
41. Becker RE. In: Brooks RE, ed. *Life in Motion: The Osteopathic Vision of Rollin E. Becker, DO*. Portland, OR: Rudra Press; 1997:181-182.
42. Brooks RE. Editor's Note. In: Brooks RE, ed. *Life in Motion*. Portland, OR: Rudra Press; 1997:153.
43. Davidson SM. *Neurofascial Release: A Course in Guided Palpation and Treatment*. Phoenix AZ: Practical Publications; 1990:1-20.
44. MacDonald RC. "The energy cyst": Its ramifications and use in osteopathic manipulative management. *AAO Journal*. 2003;13(3):16-18.
45. Upledger JE. *Craniosacral Therapy II: Beyond the Dura*. Seattle, WA: Eastland Press; 1987:212-214.
46. Holland EC. Viscoelastic and Viscoplastic Axes of Motion in the Cranium: The Biophysics of Cranial Osteopathy [Video], 1992.
47. Holland EC. *The Biophysics of Fulford Techniques*, 2012; Sebastopol, CA.
48. O'Connell JA. Myofascial Release Approach. In: Chila AG, ed. *Foundations of Osteopathic Medicine*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:699-700.
49. O'Connell JA. *Bioelectric Fascial Activation and Release*. Indianapolis, IN: American Academy of Osteopathy; 2000:22-25:59-78.
50. Comeaux ZJ. Facilitated oscillatory release-a method of dynamic assessment and treatment of somatic dysfunction. *AAO Journal*. 2003;13(3):30-35.
51. Lee RP. *Interface: Mechanisms of Spirit in Osteopathy*. Portland, OR: Stillness Press; 2005:169-266.
52. Lee RP. Spirituality in osteopathic medicine. *AAO Journal*. 2000;10(4):31-36.
53. Hendryx JT. *Healer's Touch: A Physician's Journey into the Medical, Miracle, and Mystical Aspects of Healing*. Mt. Jewett, PA: Transformations Press; 2006:107-108.
54. Hendryx JT, O'Brien RL. Dynamic Strain-Vector Release: An energetic approach to OMT. *AAO Journal*. 2003;10(3):19-29.
55. McConnell CP. Fundamental fragments. Relatedness. From J Am Osteopathic Assoc 1939. In: Jordan T, Schuster R, eds. *Selected Writings of Carl Phillip McConnell, DO*. Columbus, OH: Squirrel's Tail Press; 1994:129-130.
56. California Energy Commission. The Energy Story - Chapter 1: Energy - What Is It? *Energy Quest*. 1994-2012. Available at: <http://www.energyquest.ca.gov/story/chapter01.html>. Accessed January 12, 2013.
57. OSU Chemistry. 1st Law of Thermodynamics. *The Ohio State University*. Available at: http://chemistry.osu.edu/~woodward/ch121/ch5_law.htm. Accessed January 12, 2013.
58. Oschman JL. *Energy Medicine: The Scientific Basis*. New York, NY: Churchill Livingstone; 2000.
59. Oschman JL. *Energy Medicine in Therapeutics and Human Performance*. New York, NY: Butterworth/Heinemann; 2003:xxvi.
60. Oschman JL. *Energy Medicine in Therapeutics and Human Performance*. New York, NY: Butterworth/Heinemann; 2003.
61. O'Connell JA. Myofascial Release Approach. In: Chila AG, ed. *Foundations of Osteopathic Medicine*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:698-727.
62. Handoll N. *Anatomy of Potency*. Hereford, UK: Osteopathic Supplies Ltd; 2000:49-147.
63. NIH. What is Complementary and Alternative Medicine? *National Center for Complementary and Alternative Medicine (NCCAM)*. Available at: <http://nccam.nih.gov/health/whatiscam>. Accessed June 28, 2012.
64. Rubik B. The biofield hypothesis, its biophysical basis and role in medicine. *J Altern Complement Med*. Dec 2002;8(6):703-17.
65. Tiller WA. *Science and Human Transformation: Subtle Energies, Intentionality, and Consciousness*. Walnut Creek, CA: Pavior Publishing; 1997:36.
66. Tiller WA. *Science and Human Transformation: Subtle Energies, Intentionality, and Consciousness*. Walnut Creek, CA: Pavior Publishing; 1997.
67. Educational Council on Osteopathic Principles. *Glossary of Osteopathic Terminology*. Chevy Chase, MD: American Association of Colleges of Osteopathic Medicine; 2011:26.
68. DiGiovanna EL. Somatic Dysfunction. In: DiGiovanna EL, Schiowitz S, Dowling DJ, eds. *An Osteopathic Approach to Diagnosis and Treatment*. 3rd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2005:16-23.
69. Stiles E. Biotensegrity and Areas of Greatest Restriction, 2007; AOA Convention. San Diego, CA.
70. Chikly B, Lossing K. Lymphatic Applications to the Viscera, 2005; Glendale, AZ.
71. Holland EC. *Holonomics and Relationism: The Principles of Integrative Medicine*. Sebastopol, CA: The Holonomic Institute; 2009:2-25.
72. Mandelbrot BB. *the Fractal Geometry of Nature*. New York, NY: W.H. Freeman and Company; 1983:6-165.
73. Lee RP. *Interface: Mechanisms of Spirit in Osteopathy*. Portland, OR: Stillness Press; 2005:226-27.
74. Holland EC. *Holonomic Perception: Cognitive Skills, Perceptual Physiology, and Perceptual Transference*. Sebastopol, CA: The Holonomic Institute; 2009:12-20.
75. Still AT. *The Philosophy and Mechanical Principles of Osteopathy*. Kirksville, MO: Osteopathic Enterprise; 1892:60.

76. Stedman TL. *Stedman's Medical Dictionary*. 27th ed. Baltimore, MD: Lippincott, Williams & Wilkins; 2000:647.
77. Willard F. Fascial Continuity from the Thoracic Diaphragm to the Pelvic Diaphragm, 2011; AAO Convocation. Colorado Springs, CO.
78. Willard FH, Fossum C and PR Standley. The Fascial System of the Body. In: Chila AG, ed. *Foundations of Osteopathic Medicine*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2011:74-92.
79. In: Warwick R, Williams PL, eds. *Gray's Anatomy*. 35th ed. Philadelphia, PA: W.B. Saunders Company; 1973:32-48.
80. Schleip R, Klingler W, Lehmann-Horn F. Active fascial contractility: Fascia may be able to contract in a smooth muscle-like manner and thereby influence musculoskeletal dynamics. *Med Hypotheses*. 2005;65(2):273-7.
81. Schleip R, Naylor IL, Ursu D, et al. Passive muscle stiffness may be influenced by active contractility of intramuscular connective tissue. *Med Hypotheses*. 2006;66(1):66-71.
82. O'Connell JA. *Bioelectric Fascial Activation and Release*. Indianapolis, IN: American Academy of Osteopathy; 2000:34-58.
83. Lee RP. *Interface: Mechanisms of Spirit in Osteopathy*. Portland, OR: Stillness Press; 2005:149-150:153-155:265.
84. Sutherland WG. In: Sutherland AS, Wales AL, eds. *Contributions of Thought: The Collected Writings of William Garner Sutherland, D.O.* 2nd ed. Portland, OR: Rudra Press; 1998:142-143:147.
85. Sutherland WG. In: Wales AL, ed. *Teachings in the Science of Osteopathy*. Fort Worth, TX: Sutherland Cranial Teaching Foundation; 1990:166-189.
86. Nelson KE, Glonek T. *Somatic Dysfunction in Osteopathic Family Medicine*. Baltimore, MD: Lippincott, Williams & Wilkins; 2007:130.
87. Nelson KE, Sergueef N, Lipinski CM, et al. Cranial rhythmic impulse related to the Traube-Hering-Mayer oscillation: Comparing laser-Doppler flowmetry and palpation. *J Am Osteopath Assoc*. 2001(101):163-173.
88. Geiger B, Spatz JP, Bershady AD. Environmental sensing through focal adhesions. *Nature Reviews: Molecular Cell Biology*. 2009;10(1):21-33.
89. Ingber DE. The architecture of life. *Scientific American*. January 1998:48-57.
90. Ingber DE. Tensegrity I. Cell structure and hierarchal systems biology. *Journal of Cell Science*. 2003;116(7):1157-1173.
91. Ingber DE. Tensegrity II. How structural networks influence cellular information processing networks. *Journal of Cell Science*. 2003;116(8):1397-1408.
92. Jaalouk DE, Lammerding J. Mechanotransduction gone awry. *Nature Reviews: Molecular Cell Biology*. 2009;10(1):63-73.
93. Wang N, Tytell JD, Ingber DE. Mechanotransduction at a distance: mechanically coupling the extracellular matrix with the nucleus. *Nature Reviews: Molecular Cell Biology*. 2009;10(1):75-82.
94. Swanson RL. Biotensegrity: a unifying theory of biological architecture with applications to osteopathic practice, education, and research--A review and analysis. *J Am Osteopath Assoc*. January 2013;113(1):34-52.
95. Davidson SM. Neurofascial Release Course, 2001; Phoenix, AZ.
96. Malina B. *Neurofascial Release: An Instruction Manual*. Chandler, AZ: Self published; 1996:1-28.
97. Davidson SM. Advanced Neurofascial Release Course: Visceral Manipulation, 2003; Phoenix, AZ.
98. The Center for History of Physics. Einstein Exhibit - E=mc2. *American Institute of Physics*. 1996-2013. Available at: <http://www.aip.org/history/einstein/emc1.htm>. Accessed January 12, 2013.
99. Crisera P. *Cranio-Sacral Energetics, Volume I*. Rome, Italy: S.M.I.S.R.L.; 1997:13-14:48-56.
100. Lee RP. *Interface: Mechanisms of Spirit in Osteopathy*. Portland, OR: Stillness Press; 2011:170-210:229.
101. McConnell CP. The Osteopathic Approach. *J Am Osteopath Assoc* June 1938. In: Jordan T, Schuster R, eds. *Selected Writings of Carl Philip McConnell, D.O.* Columbus, OH: Squirrel's Tail Press; 1994:28-32.
102. American Academy of Osteopathy. AAO Convocation 2013: Mechanotransduction and the Interstitium: The World In Between, 2013; Orlando, FL.
103. DiGiovanna EL. Introduction to Osteopathic Medicine. In: DiGiovanna EL, S Schiowitz, eds. *An Osteopathic Approach to Diagnosis and Treatment*. 2nd ed. Philadelphia, PA: Lippincott-Raven; 1997:14.
104. DeStefano LA. The Manipulative Prescription. *Greenman's Principles of Manual Medicine*. 4th ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2011:50.
105. Greenman PE. *Principles of Manual Medicine*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2003:48.
106. Burns D. *An Introduction to Biophysics*. London, UK: J. & A. Churchill; 1921.
107. Gratzer WB. Biophysics - whence, whither, wherefore - or Hold that hyphen. *BMC Biology*. 2011;9:12.
108. Lambert N, Chen YN, Cheng YC, et al. Quantum biology. *Nat Phys*. December 2012:1-9.
109. Starfield B. Is US Health Really the Best in the World? *JAMA*. July 2000;284(4):483-485.

Accepted for publication November 2013.

Address correspondence to:

Jan T. Hendryx, DO, FAAO
5401 Peach St., Suite 3400
Erie, PA 16509

Abstract: Second-year Osteopathic Student Evaluation of the Prevalence of a Positive Thomas Test and a Psoas Tender Point Before and After Treatment with Counterstrain Technique

Jocelyn Young, OMS III; Sheldon C. Yao, DO; Reem Abu-Sbaih, DO; and To Shan Li, DO
New York Institute of Technology College of Osteopathic Medicine. 2013.

Editor's Note: This abstract was presented as part of the Louisa Burns Osteopathic Research Committee poster competition at the 2013 AAO Convocation in Orlando, FL.

Objectives

Psoas muscle dysfunctions can cause low back pain. Osteopathic physicians use counterstrain to treat the tender point that can occur when there is a muscle contraction or spasm in the psoas. The Thomas test is a special test utilized to diagnosis a psoas spasm, and there have been several studies which established the Thomas test as an effective means to diagnose these dysfunctions. However, there have not been any studies that looked for a relationship between a positive Thomas test and psoas tender point presence. We had three objectives in this study:

1. to establish that subjects with a positive Thomas test would have higher odds of a positive psoas tender point;
1. to look for an improved Thomas test following treatment with the appropriate counterstrain technique (if the tender point was present); and
1. to collect data to determine the effectiveness of counterstrain treatment for the psoas muscle as performed by students.

Methods

Second-year medical students at New York Institute of Technology College of Osteopathic Medicine (NYIT-COM) utilized an osteopathic manipulative medicine (OMM) lab worksheet which asked students to work in pairs and perform a Thomas test, look for a psoas

tender point, and if it was present, grade it on a pain scale of 0 to 10, treat it with counterstrain and then reassess the tenderness and Thomas test. Students recorded all responses on their worksheets, which were collected at the end of the laboratory session. The student responses were analyzed as data.

Results

Students with a positive Thomas test had a psoas tender point in a statistically significant higher proportion than those with a negative Thomas test ($p=.04$). If the subject with a positive Thomas test also had a psoas tender point that was treated, we found that 68.2% had an improved Thomas test, defined as decreased hip flexion of the affect side. Of all psoas tender points students found and treated, 3.4 was the initial mean number reported on the pain scale. After treatment the mean was reduced to 0.6, suggesting effective treatment of the psoas tender point ($p<.001$).

Conclusions

Our results have shown that in a healthy population of second-year medical students, the finding of a positive Thomas test increases the probability a psoas tender point is present twofold. The results also demonstrated that second-year students were effective in utilizing counterstrain technique to treat a psoas tender point when found. While not statistically significant, we also showed that a large percentage of positive Thomas tests can be improved with counterstrain treatment to the psoas.

Resolution of Post-traumatic Temporomandibular Joint Pain, Headache and Vision Changes with OMM in the Unified Field: A Case Report

James A. Lipton, DO, CSP-OMM, FAAO, FAAPMR, DAOBPMR;
and ENS Matthew G. Case, MC, USNR, MSIV

The views in this article are those of the authors and do not reflect the official policy or position of the Department of the Navy, Department of Defense or the United States Government.

Abstract

This is a report of a case of a patient with symptoms of temporomandibular joint pain (TMJP), trismus, migraine headaches and associated left eye blurred vision daily for years. Previously seen and treated by non-osteopathic providers, this patient reported failed treatments including dental guards, muscle relaxers, over-the-counter analgesics and narcotics. Following a single treatment with osteopathic manipulative medicine (OMM) the patient reported resolution of her symptoms, allowing her to discontinue the use of specially made glasses with a left eye corrective lens.

Key Words: osteopathic manipulative medicine (OMM), osteopathic manipulative treatment (OMT), craniosacral, cranial, manual medicine, posttraumatic headaches, migraine, tension headache, cervicogenic headache, temporomandibular joint dysfunction, traumatic vision loss, zygomatic trauma, somatic dysfunction and unified field.

Introduction

Various headaches due to head and neck trauma are among the most reported symptoms following injury.¹⁻³ According to the International Headache Society's ICHD-3b, a distinguishing feature of posttraumatic headaches is the temporal relation to a known traumatic incident.⁴ Posttraumatic headaches are not fully understood; a specific diagnosis is not often assigned and an optimal course of treatment is not always provided for those who seek treatment.⁵

Posttraumatic headaches can be similar to non-traumatic headaches.^{4,6-8} Traumatic headaches in athletes can have symptoms similar to tension, migraine, cluster and mixed posttraumatic headaches regardless of the severity of the head trauma.^{4,5} Based on ICHD-3b criteria, new onset headaches within seven days of head trauma are diagnosed as *acute posttraumatic headache* while continued headache

after three months is termed *persistent posttraumatic headache*.^{4,8,9,77} Even mild head trauma without loss of consciousness or objective findings can cause new onset or exacerbation of headaches necessitating long-term management.^{4-6,9}

Diagnosing a patient with a migraine following a posttraumatic injury can be linked to a patient's medical history and reported symptoms.^{6,9} Typical characteristics are phonophobia, photophobia and increased pain with physical exertion.^{4,5,9-11} The three most predictive characteristics for migraine diagnosis are disability, nausea and photophobia although no isolated characteristic is necessary to make the diagnosis of migraine.⁹

Treatment for headaches can be based on the description of the headache, for example, tension type, cluster, cervicogenic or migraine. Headaches can be managed with medication, but some patients don't tolerate medications due to the side effects, can't take them due to the contraindications, may need additional treatment or choose alternative treatments.^{1,12-18} Pharmacological treatments for migraine headaches can include non-steroidal anti-inflammatory drugs, anticonvulsants, tricyclics, calcium channel blockers and triptans.^{6,9,12,16,19} Despite advanced drug therapies, there can remain sufferers with refractory headache who fail to respond to current pharmacologic treatments or return to baseline symptoms once medications are stopped. Pharmacological treatments are not suitable for all patients, nor are they universally effective.^{1,13,14,20}

Manipulative medicine may be useful as a treatment for headaches.^{11,14,15,18,20-30} Manipulative medicine has been described as being used to improve circulation, release restrictions in joints, reduce tension in muscles, fascia and dura mater, decrease nociceptive input and promote the normalization of the central nervous system.^{26,31-34}

The literature on osteopathic treatment of posttraumatic headaches with vision restoration is sparse. Wingfield et al,³⁵ Gorman,^{36,37} and Stephens

et al^{38,39} describe visual impairments successfully treated with manual manipulation in patients without posttraumatic headaches. A survey published by Jonson et al reports osteopathic physicians using OMM to treat headaches, concussions and diplopia.²⁷ Electronic literature searches were carried out on Google Scholar, the National Library of Medicine (MEDLINE) and the Cochrane Databases for published material in the English language. Literature addressing the diagnosis and treatment of posttraumatic headaches, temporomandibular joint pain and dysfunction, and blurry vision treated with osteopathic manual manipulation was reviewed and included in this case report.

Report of Case

A 27-year-old female presented to physical medicine and rehabilitation for evaluation of chronic right-sided TMJP, trismus and daily migraines with associated blurry vision of the left eye. The patient stated her symptoms were the accumulation of two separate traumatic incidents. Following a physical altercation five years prior to treatment, the patient was struck on the right side of her head just anterior to her ear. Three years prior to treatment the patient reported a fall aboard ship where she struck her head against metal framing and injured her right shoulder, requiring a Bankart repair.

Following the first incident, the patient began to experience intermittent headaches that were unlike any previous headache she had experienced. Following the second incident, the patient states the headaches became more frequent, occurring every day with increased pain. Temporomandibular discomfort with eating and trismus also began following the second incident.

Over the course of four years, the patient was treated for temporomandibular joint dysfunction (TMJD), migraines and new onset blurry vision through various allopathic providers. The patient was fitted with dental guards to address her TMJP, but they provided no relief. The patient was also evaluated and treated by neurology for her headaches, resulting in medication with no success.

Imaging obtained through her previous treatment included a normal MRI of her head and a normal Panorex film of her jaw.

During her history of treatment, the patient was provided multiple drugs, including muscle relaxers (cyclobenzaprine), narcotics (hydrocodone with acetaminophen and oxycodone with acetaminophen),

nonsteroidal anti-inflammatory (naproxen) and tramadol. The patient explained that she has a history of being very sensitive to medications and found oxycodone to be too sedating; the hydrocodone and naproxen resulted in itching, and no relief was provided from the cyclobenzaprine or tramadol.

The patient's review of systems included right-sided jaw pain, reduced oral opening and a corrective lens for her left eye blurred vision. The patient reported having persistent jaw pain with 8/10 pain most notably while she was eating. The patient reported that her headaches were daily and could last between 45 minutes to 24 hours and could range in severity from 4/10 to 8/10.

On physical exam the patient's C3 was ER_LS_L, and C4 was ER_RS_R. Straight-line opening of the jaw with diminished opening was noted with lateral pterygoid restriction, marked right sphenoid torsion and temporal restriction. A torus palatinus was noted.

Treatment was based on osteopathic principles and practice and chosen as a result of clinical experience with the use of Osteopathy in the unified field.⁴⁰ Treatment involved OMM techniques including myofascial release, muscle energy (ME), high-velocity low-amplitude (HVLA) and cranial techniques directed toward involving intraoral and extraoral locations, the rectus capitis posterior minor, associated myodural bridge²¹ and cranial bones to specifically address this patient's individual response to treatment.

Immediately following the first treatment, the patient reported complete resolution of her symptoms and improvement was noted in the patient's straight-line opening of the jaw.

The patient followed up two and three weeks after her initial treatment and reported her pain was 0/10. She had not experienced any migraines following her first treatment and no longer experienced TMJP. She also had not used her corrective lens since her first treatment. Twenty-four days following her first treatment, she was without restriction in any of her cranial bones. Her C4 was ER_LS_L and was treated with facilitated positional release. She was a 0/10 pre-treatment and 0/10 post-treatment with resolution of her somatic dysfunction. Phone communication at thirty-five days post-treatment revealed she was still symptom free.

Discussion

In the fall of 1994, "The Cranial Rhythmic Impulse and Headache, A Synthesis for Clinicians and Scientists Working Toward Mutual Education" was published. Numerous areas of further study were proposed,

including suggestions for furthering our understanding of anatomic relationships in regard to headache.¹² Among the topics covered in the paper were the dura, emissary veins, scalp tension, the palpation of external head and body tissues, intervertebral disc spaces and their relationship to proprioception, blood flow, cerebrospinal fluid flow, cranial rhythmic impulse and hormones as they relate to headache.¹²

Working independently in a pilot study in December 1994, Hallgren, Greenman and Rechten⁴¹ looked at the MRI imaging of six patients in regard to finding atrophy of the rectus capitis major and minor muscles in some subjects with chronic head and neck pain.

Again working independently in May 1995, Hack, Koritzer, Robinson, Hallgren and Greenman identified connections between the rectus capitis posterior minor (RCPMi) and spinal dura mater at the atlanto-occipital junction.⁴²

The term *unified field* has been discussed in physics for years and has been in use since at least the mid-nineteenth century. In physics many scientists worked to describe the inter-relationship between the fundamental forces of nature and particle behavior within a single framework.⁴³ In October 1995 the author articulated the concept of the Unified Field in Osteopathy, which he originated, in a presentation given to the American Academy of Osteopathy at the American Osteopathic Association meeting held in Orlando, Florida.⁴⁰ In this presentation the author named the myodural bridge. The clinical implications of a cervical myodural bridge were published in the winter of 1997 by Hallgren, Hack and Lipton, again documenting the above.²¹ Numerous articles have mentioned these topics since.^{9,44-51}

This unified field involves Osteopathy in the Unified Field.⁴⁰ The understanding of the unified field is based on concepts of Osteopathy first enunciated by Andrew Taylor Still,⁵² the founder of the osteopathic profession and carried forward by William Garner Sutherland,⁵³ Harold Magoun,⁵⁴ Viola Frymann,⁵⁵ Robert Fulford⁵⁶ and countless other skilled osteopathic practitioners. This unified field is a synthesis of basic science, allopathic, dental and osteopathic thought regarding the anatomy and its clinical implications, both with respect to diagnosis and treatment⁴⁰—in other words, the unified relationship between the many central and peripheral mechanisms that interact in dynamic homeostasis. The literature on and the acceptance of the unified field in osteopathy continues to grow to such an extent that it was the topic of the American Academy of Osteopathy's annual convocation in Louisville, Kentucky, March 2012.^{57,58}

A tenet of osteopathy states that structure and function are reciprocally interrelated.⁵⁹ Abnormalities of the musculature or the osseous joint complexes of the cervical spine have been implicated in head pain.^{9,11,15,23,26,29,44,60,61,62,63} Painful stimuli can elicit a heightened sympathetic response that can cause vasoconstriction, chemical changes, and more muscle contraction.^{26,32} Increased muscle tension can translate through extra-cranial connections like myodural bridges in the upper cervical spine.^{9,12,21,29,46,47,64} Dysfunction of the upper cervical region following injury has also been implicated in abnormal function of the jaw.⁴⁴ Severinsson et al report an increased risk of developing TMJD in women with cranial cervical symptoms following neck injuries and posttraumatic stress.⁶⁵ Osteopathic treatment resulted in the use of less medicine in one study comparing the treatment of TMJD to non-manipulative treatment.⁶⁶

Cranial OMM involves the treatment of cranium and its interrelationship with the body as a whole, including a system of diagnostic and therapeutic modalities with application in treating disease.^{12,67,68} Sandhouse et al studied myopia and hyperopia and determined that patients who underwent cranial treatment had improvement in their visual acuity following a single treatment. Their treatment was said to involve manipulation of the sphenoid bone and was directed at releasing fascial and bony restrictions, thereby normalizing the innervation and subsequent function of the eyes.^{67,69,70}

There are times when surgery is necessary to treat the body. Examples of surgery in a condition that might be favorably treated with OMM would be with respect to piriformis syndrome⁷¹ and with respect to a case report on chronic headache relief after section of suboccipital dural connections by Hack and Hallgren.⁷²

The use of manipulative medicine is an effective alternative to pharmacological and surgical treatments with respect to headaches. Manipulation as a treatment for migraines, cervicogenic and tension headaches has been reported to be effective at reducing the frequency and severity of headaches.^{1,14,17,18,20-22,25,27,28,30,32,73} There are reports of immediate results after a single treatment.^{14,30} Studies have reported the long-term effects of OMM treatments still being efficacious 12 months or greater following manipulative treatment.^{15,24,30} Addressing dysfunction of the musculature or the joint complexes of the cervical region, where pain may originate, could explain the resolution of patients' symptoms following treatment of that same area.^{9,11,15,23,26,29,44,60,61,72} Physical attempts at treatment of headache by accessing seemingly

unrelated peripheral locations are not confined to manipulation of the neck. Osteopathic physicians' approach to patient care is rooted in individualized treatment with respect to each patient as a result of a comprehensive examination.^{74,75} Examples might be the anecdotal use of pressure in the hand in the web space between the first and second digit and numerous studies reviewed in evaluating the evidence for the use of acupuncture for relief of headache.⁷⁶

Yet, there is more to examine in the close clinical correlation between symptom and structure involved in headaches, particularly in tension headaches. It is common clinical knowledge that a headache is often described by patients as starting at the base of the skull (RCPMi, myodural bridge location and dural connections) and progressing to scalp tension (frontalis contraction and a combined feeling of a band of stricture around the head). Perhaps interruption of the headache is achieved by manipulating tissue, causing a reset of the myodural connection functioning as a strain gauge? Perhaps with rapid vasodilation of arterioles commonly described in migraine headache theory as irritating dura, the body's attempt at blood flow regulation may involve the emissary veins? One interesting review noted that thermoregulation could reverse venous flow through emissary veins of the skull.⁴⁹ Nontraumatic headaches can begin with a thought, the consequences of which are felt in the unified field. If the scalp tension is initiated by a strain gauge mechanism responsive to OMM, then severing the relationship might not be the first consideration. The clinician may be able to manipulate the unified field in support of the body's effort to restore homeostasis.⁴⁹ A common knowledge concept taught in medical schools across the country is the relationship between head trauma and the need for reduction of intracranial pressure through the use of hyperventilation to protect brain function. This is an example of using the secondary respiratory mechanism to influence the internal biochemistry of cerebral spinal fluid far afield with the aid of chemoreceptors on the floor of the fourth ventricle. Interesting that the OMM successfully applied in this case involves anatomy so close to the cerebrospinal fluid, the dura, the attached myodural bridge and the changes in respiration we as clinicians treating headache so often witness our patients undergo during application of OMM. Andrew Taylor Still as a surgeon thought long and hard on alternatives to surgery where appropriate. As a result, osteopathic physicians and surgeons work in concert with colleagues across many disciplines to further our understanding of how the human body works in such a wondrous way.

Conclusion

Following a single in-office OMM treatment, the patient was provided with complete resolution of her complaints of TMJP, daily migraines, trismus and blurry eyesight that had been present daily for years.

References

1. Barke L, Gelman S, Lipton JA. A successful use of cranial-sacral osteopathy in the treatment of post-traumatic headache following subarachnoid hemorrhage. *Am Acad Osteopathy J*. 1997;7(2):22-23.
2. Obermann M, Holle D, Katsarava Z. Post-traumatic headache. *Expert Review of Neurotherapeutics*. 2009;9(9):1361-1370.
3. Weiss HD, Stern BJ, Goldberg J. Post-traumatic migraine: chronic migraine precipitated by minor head or neck trauma. *Headache: The Journal of Head and Face Pain*. 1991;31(7):451-456.
4. Headache Classification Committee of the International Headache Society (IHS). The international classification of headache disorders, (beta version). *Cephalalgia*. 2013;33(9):629-808.
5. Mihalik JP, et al. Posttraumatic migraine characteristics in athletes following sports-related concussion. *Journal of Neurosurgery*. 2005;102(5):850-855.
6. Erickson J, Neely E, Theeler B. *Posttraumatic headache*. Minneapolis, MN: Continuum. 2010;16:55Y78
7. Packard RC. Epidemiology and pathogenesis of posttraumatic headache. *The Journal of Head Trauma Rehabilitation*. 1999;14(1):9-21.
8. Obermann M, Keidel M, Diener HC. Post-traumatic headache: Is it for real? Crossfire debates on headache: Pro. *Headache: The Journal of Head and Face Pain*. 2010;50(4):710-715.
9. Mueller LL. Diagnosing and managing migraine headache. *JAOA*. 2007;107(suppl 6):ES10-ES16.
10. Evans RW. Persistent post-traumatic headache, postconcussion syndrome, and whiplash injuries: the evidence for a non-traumatic basis with an historical review. *Headache: The Journal of Head and Face Pain*. 2010;50(4):716-724.
11. van Duijn J, van Duijn AJ, Nitsch W. Orthopaedic manual physical therapy including thrust manipulation and exercise in the management of a patient with cervicogenic headache: a case report. *J Man Manip Ther*. 2007;15(1):10.
12. Lipton JA. The cranial rhythmic impulse and headache: a synthesis for clinicians and scientists working toward mutual education. *AAO Journal*. 1994;4(3):929.
13. Wolter T, Kaube H, Mohadjer M. High cervical epidural neurostimulation for cluster headache: case report and review of the literature. *Cephalalgia* 2008;28(10):1091-1094.
14. Keays AC, et al. Is osteopathic manipulation effective for headaches? *Journal of Family Practice*. 2008;57(3):190-191.
15. Bronfort G, et al. Efficacy of spinal manipulation for chronic headache: a systematic review. *J Manipulative Physiol Ther*. 2001;24(7):457-466.
16. Schulman EA, et al. Defining refractory migraine and refractory chronic migraine: proposed criteria from the Refractory Headache Special Interest Section of the American Headache Society." *Headache: The Journal of Head and Face Pain*. 2008;48(6):778-782.

17. Lenssinck MLB, et al. The effectiveness of physiotherapy and manipulation in patients with tension-type headache: a systematic review. *Pain*. 2004;112(3):381-388.
18. Chaibi A, Tuchin PJ, Russell MB. Manual therapies for migraine: a systematic review. *The Journal of Headache and Pain*. 2011;12(2):127-133.
19. Bajwa ZH. Acute Treatment of Migraine in Adults. In: Basow DS, ed. *UpToDate*. Waltham, MA: UpToDate; 2013.
20. *Evidence Report: Behavioral and Physical Treatments for Tension-type and Cervicogenic Headache*. Des Moines, IA: Foundation for Chiropractic Education and Research; 2001.
21. Hallgren RC, Hack GD, Lipton JA. Clinical implications of a cervical myo-dural bridge. *AAO Journal*. (1997);7:30-34
22. Biondi DM. Views and Perspectives Physical Treatments for Headache: A Structured Review. 2004;738-747.
23. Biondi DM. Cervicogenic headache: mechanisms, evaluation, and treatment strategies. *JAOA*. 2000;100(9 suppl):7S-14S.
24. Voigt K, et al. Efficacy of osteopathic manipulative treatment of female patients with migraine: results of a randomized controlled trial. *The Journal of Alternative and Complementary Medicine*. 2011;17(3):225-230.
25. Grant T, Niere K. Techniques used by manipulative physiotherapists in the management of headaches. *The Australian Journal of Physiotherapy*. 2000;46(3):215-222.
26. Kozminski M. Combat-related posttraumatic headache: diagnosis, mechanisms of injury, and challenges to treatment. *JAOA*. 2010;110(9):514-519.
27. Johnson SM, Kurtz ME. Conditions and diagnoses for which osteopathic primary care physicians and specialists use osteopathic manipulative treatment. *JAOA*. 2002;102(10):527-540.
28. Schabert E, Crow WT. Impact of osteopathic manipulative treatment on cost of care for patients with migraine headache: a retrospective review of patient records. *JAOA*. 2009;109(8):403-407.
29. Alix ME, Bates DK. A proposed etiology of cervicogenic headache: the neurophysiologic basis and anatomic relationship between the dura mater and the rectus posterior capitis minor muscle. *J Manip Physiol Ther*. 1999;22(8):534-539.
30. Jull G, et al. A randomized controlled trial of exercise and manipulative therapy for cervicogenic headache. *Spine*. 2002;27(17):1835-1843.
31. Michal I. Treatment approaches in osteopathy for the therapy of migraine. Diss. Thesis, 2009.
32. Anderson RE, Seniscal C. A comparison of selected osteopathic treatment and relaxation for tension-type headaches. *Headache: The Journal of Head and Face Pain*. 2006;46(8):1273-1280.
33. Editorial Staff. Missing anatomical link supports chiropractic for headaches. *Dynamic Chiropractic*, 15 June 1998. Web. 23 Nov. 2013.
34. Pick MG. A preliminary single case magnetic resonance imaging investigation into maxillary frontal-parietal manipulation and its short-term effect upon the intercranial structures of an adult human brain. *J Manip Physiol Ther*. 1994;17(3): 168.

Osteopathic Approach to Common ENT Complaints of Children

March 17-18, 2014

Course Description

This course is designed for participants with intermediate to advanced skills in OMM and those who have taken intermediate-level Cranial courses. We will take an in-depth look at the anatomical and structural influences of the pediatric ENT patient, taking a close look at the cranial and facial anatomy and its influences on health and function of the middle ear, sinuses and temporomandibular joint.

CME

16 hours of AOA Category 1-A credit are anticipated.

Course Times

Monday and Tuesday: **8:00 am - 5:30 pm**
Breakfast and lunch on your own, coffee provided.

Course Location

The Broadmoor

1 Lake Avenue, Colorado Springs, CO 80906
Reservations: 7am to 9pm (MT), seven days a week.
(800) 634-7711 (*Mention AAO event.*)
<https://resweb.passkey.com/go/aao14>

Early registration extended to March 11!

Heather P. Ferrill, DO, Program Chair

Dr. Ferrill, a 2000 Michigan State University College of Osteopathic Medicine graduate, is an Associate Professor of Osteopathic Manipulative Medicine (OMM) at the Rocky Vista University College of Osteopathic Medicine (RVUCOM). Board-certified in Family Practice and Neuromusculoskeletal Medicine/OMM, her practice emphasizes Osteopathic Manipulative Treatment in the pediatric population. She serves on the AAO Board of Governors and the Education Committee.



Click here to register online.



Register online at www.academyofosteopathy.org. For travel arrangements, Contact Tina Callahan of Globally Yours Travel at (800) 274-5975 or globallyyourstravel@cox.net.



35. Wingfield BR, Gorman RF. Treatment of severe glaucomatous visual field deficit by chiropractic spinal manipulative therapy: a prospective case study and discussion. *J Manip Physiol Ther.* 2000;23(6): 428-434.
36. Gorman RF. The treatment of presumptive optic nerve ischemia by spinal manipulation. *J Manip Physiol Ther.* 1995;18(3): 172.
37. Gorman RF. Monocular visual loss after closed head trauma: immediate resolution associated with spinal manipulation. *J Manip Physiol Ther.* 1995;18(5): 308.
38. Stephens D, Gorman RF. Does normal vision improve with spinal manipulation? *J Manip Physiol Ther.* 1995;19(6): 415-418.
39. Stephens D, et al. Bilateral simultaneous optic nerve dysfunction after pariorbital trauma: recovery of vision in association with chiropractic spinal manipulation therapy. *J Manip Physiol Ther.* 1999;22(9): 615-621.
40. Lipton JA, Hack GD. The clinical implications of a suboccipital myodural bridge. Proceedings of the American Academy of Osteopathy Scientific Convention, Oct. 29-31, 1995; Orlando, FL.
41. Hallgren RC, Greenman PE, Rechten JJ. Atrophy of suboccipital muscles in patients with chronic pain: a pilot study. *JAOA.* 1994;94(12): 1032-1032.
42. Hack GD, et al. Anatomic relation between the rectus capitis posterior minor muscle and the dura mater. *Spine.* 1995;20(23): 2484-2485.
43. Unified Field Theory. Encyclopædia Britannica. Encyclopædia Britannica Online. Encyclopædia Britannica Inc., 2013. Web. 12 Nov. 2013 <<http://www.britannica.com/EBchecked/topic/614522/unified-field-theory>>.
44. McPartland JM, Brodeur RR. Rectus capitis posterior minor: a small but important suboccipital muscle. *Journal of Bodywork and Movement Therapies.* 1999;3(1): 30-35.
45. Kahkeshani K, Ward PJ. Connection between the spinal dura mater and suboccipital musculature: evidence for the myodural bridge and a route for its dissection—a review. *Clinical Anatomy.* 2012;25(4): 415-422.
46. Scali F, et al. Histological analysis of the rectus capitis posterior major's myodural bridge. *The Spine Journal.* 2013.
47. Demetrious J. Post-traumatic upper cervical subluxation visualized by MRI: a case report. *Chiropractic & Osteopathy.* 2007;15(1): 1-7.
48. Nash L, et al. Configuration of the connective tissue in the posterior atlanto-occipital interspace: a sheet plastination and confocal microscopy study. *Spine.* 2005;30(12): 1359-1366.
49. Ferguson A. A review of the physiology of cranial osteopathy. *J Osteo Med.* 2003;6(2): 74-84.
50. Scali F, et al. Magnetic resonance imaging investigation of the atlanto-axial interspace. *Clinical Anatomy.* 2012.
51. Elliott J, et al. Fatty infiltration in the cervical extensor muscles in persistent whiplash-associated disorders: a magnetic resonance imaging analysis. *Spine.* 2006;31(22): E847-E855.
52. Still AT. *Philosophy of Osteopathy.* Indianapolis, IN: American Academy of Osteopathy; 1986.
53. Braybrook JE. An exploration of the influences that shape the opinions and practices of osteopaths in relation to osteopathy in the cranial field: a research project submitted in partial requirement for the degree of master of osteopathy. Unitec Institute of Technology [i.e., Unitec New Zealand]. Diss. 2010.
54. Magoun HI. *Osteopathy in the Cranial Field.* Kirksville, MO: Journal Printing Company; 1976.
55. Frymann VM, King HH. *The Collected Papers of Viola M. Frymann: Legacy of Osteopathy to Children.* Indianapolis, IN: American Academy of Osteopathy; 1998.

Osteopathic Considerations in Sports Medicine

June 13-15, 2014 • MWU/CCOM, Downers Grove, IL

Course Description

This course will outline a manipulative approach to common sports medicine injuries and conditions of the spine, upper extremity and lower extremity. The program will have a balanced content of didactic material and hands-on OMT workshops.

CME

20 hours of AOA Category 1-A CME credit are anticipated.

Course Times

Friday, 8:00 am to 5:30 pm
 Saturday, 8:00 am to 5:30 pm
 Sunday, 8:00 am to 12:30 pm

Course Location

MWU/Chicago College of Osteopathic Medicine
 555 31st Street
 Downers Grove, IL 60515

Program Chair

Kurt P. Heinking, DO, FAAO, is a 1994 graduate of Chicago College of Osteopathic Medicine, where he currently serves as Chair of the Department of Osteopathic Manipulative Medicine. He is board certified in Osteopathic Manipulative Medicine, Family Medicine and Sports Medicine, and has a private musculoskeletal medicine practice in Willowbrook, IL. Dr. Heinking is Program Chair of the AAO Sports Medicine course and serves on the Awards Committee.



Faculty

Mark McKeigue, DO, graduated from Chicago College of Osteopathic Medicine in 1977 and completed internship and residency programs at Chicago Osteopathic Hospital. He is currently in family practice in Orland Park, IL.

[*Click here to register.*](#)

56. Fulford RC, Fulford R. *Dr. Fulford's Touch of Life: The Healing Power of the Natural Life Force*. SimonandSchuster. com; 1997.
57. Hartmann C, Pöttner M. *Classical Osteopathy: Field Theory as a Paradigm and a Fundamental Principle*.
58. Lossing KJ. The Unified Osteopathic Field Theory. Proc. of 2012 AAO Convocation, The Galt House Hotel, Louisville, KY. March 21-25 2012
59. Nelson KE. Osteopathic distinctiveness. *Somatic Dysfunction in Osteopathic Family Medicine*. 2007: 6.
60. Humphreys BK, et al. Investigation of connective tissue attachments to the cervical spinal dura mater. *Clinical Anatomy*. 2003;16(2): 152-159.
61. Treleven J, Jull G, Atkinson L. Cervical musculoskeletal dysfunction in post-concussional headache. *Cephalalgia*. 1995;14(4): 273-279.
62. Zito G, Jull G, Story I. Clinical tests of musculoskeletal dysfunction in the diagnosis of cervicogenic headache. *Manual Therapy*. 2006;11(2): 118-129.
63. Kemp III WJ, Tubbs RS, Cohen-Gadol AA. The innervation of the cranial dura mater: neurosurgical case correlates and a review of the literature. *World Neurosurgery*. 2012;78(5): 505-510.
64. Radanov BP, Stefano G, Augustiny KF. Symptomatic approach to posttraumatic headache and its possible implications for treatment. *European Spine Journal*. 2001;10(5): 403-407.
65. Severinsson Y, Bunketorp O, Wenneberg B. Jaw symptoms and signs and the connection to cranial cervical symptoms and post-traumatic stress during the first year after a whiplash trauma. *Disability & Rehabilitation*. 2010;32(24): 1987-1998.
66. Cuccia AM, et al. Osteopathic manual therapy versus conventional conservative therapy in the treatment of temporomandibular disorders: a randomized controlled trial. *Journal of Bodywork and Movement Therapies*. 2010;14(2): 179-184.
67. Jäkel A, von Hauenschild P. Therapeutic effects of cranial osteopathic manipulative medicine: a systematic review. *JAOA*. 2011;111(12): 685-693.
68. Jäkel A, von Hauenschild P. A systematic review to evaluate the clinical benefits of craniosacral therapy. *Complementary Therapies in Medicine*. 2012.
69. Sandhouse ME, et al. Effect of osteopathy in the cranial field on visual function—a pilot study. *JAOA*. 2010;110(4): 239-243.
70. Wolf AH. Osteopathic manipulative procedure in disorders of the eye. *Academy Of Applied Osteopathy*. 1970: 75.
71. Barton PM. Piriformis syndrome: a rational approach to management. *Pain*. 1991;47(3): 345-352.
72. Hack GD, Hallgren RC. Chronic headache relief after section of suboccipital muscle dural connections: a case report. *Headache: The Journal of Head and Face Pain*. 2004;44(1): 84-89.
73. Millea PJ, Brodie JJ. Tension-type headache. *American Family Physician*. 2002;66(5): 797-806.
74. Duncan B, et al. Effectiveness of osteopathy in the cranial field and myofascial release versus acupuncture as complementary treatment for children with spastic cerebral palsy: a pilot study. *JAOA*. 2008;108(10): 559-570.
75. Goldberg PM. Osteopathic medicine's holistic approach is more important than ever. *JAOA*. 2010;110(12): 741-743.
76. Manias P, Tagaris G, Karageorgiou K. Acupuncture in headache: a critical review. *The Clinical Journal of Pain*. 2000;16(4): 334-339.

Accepted for publication January 2014.

Address correspondence to:

James A. Lipton, DO, CSP-OMM,
FAAO, FAAPMR, DAOBPMR
Department of Rehabilitative Medicine Services
Veterans Administration Hospital
Hampton, VA, 23667

ENS Matthew G. Case, MC, USNR, MSIV
Virginia College of Osteopathic Medicine
Blacksburg, VA, 24073

AMERICAN OSTEOPATHIC ASSOCIATION CONTINUING MEDICAL EDUCATION

This CME Certification of Home Study Form is intended to document individual review of articles in the *American Academy of Osteopathy Journal* under the criteria described for Category 2-B CME credit.

CME CERTIFICATION OF HOME STUDY FORM

This is to certify that I, _____
Please print name

READ the following article for AOA CME credits.

Name of Article: Resolution of Post-traumatic Temporomandibular Joint Pain, Headache and Vision Changes with OMM in the Unified Field: A Case Report

Authors: James A. Lipton, DO, CSP-OMM, FAAO, FAAPMR, DAOBPMR, and ENS Matthew G. Case, MC, USNR, MSIV

Publication: *AAOJ*, Volume 24, No. 1, March 2014, pp. 22-28

Category 2-B credit may be granted for these articles.
oo _____

AOA Number

Full name: _____
(Please print)

Street address: _____

City, state, zip: _____

Signature: _____

FOR OFFICE USE ONLY

Category: 2-B Credits: _____ Date: _____

Complete the quiz to the right by circling the correct answers. Mail your completed answer sheet to the AAO. The AAO will forward your results to the AOA. You must have 70 percent accuracy in order to receive CME credits.

December 2013 AAO Journal CME quiz answers:

1. A
2. D
3. D
4. A

Answers to the March 2014 AAOJ CME quiz will appear in the June 2014 issue.

Mail this page to:
American Academy of Osteopathy
3500 DePauw Blvd.
Suite 1100
Indianapolis, IN 46268

1. A myodural bridge exists between the dura and what muscle?
 - a. Rectus capitus posterior minor
 - b. Trapezius
 - c. Levator scapulae
 - d. Biceps
 - e. All of the above
2. There may be a relationship between:
 - a. Headache and trauma
 - b. Scalp tension and scalp blood flow
 - c. OMM treatment and OMM outcome
 - d. Suboccipital muscles and headache
 - e. All of the above
3. Post-traumatic headache can be characterized by the following symptoms:
 - a. Photophobia
 - b. Phonophobia
 - c. Agorophobia
 - d. A and B
 - e. Arachnophobia
4. The Unified Field in Osteopathy involves
 - a. A dynamic distinction between the periphery and the central nervous system
 - b. A lack of structural relationship between structure and function
 - c. An appreciation of the interrelationship between Osteopathic Principle and Practice and Third Party Billers
 - d. Osteopathic principles and practice used in manipulating structure and related function in support of dynamic homeostasis
 - e. The theory describing subatomic particle behavior observed from colliding accelerated latte molecules

Abstract: Usefulness of Video Learning for Osteopathic Manipulative Medicine Techniques in the Classroom and Clinical Setting

Melissa Meghpara, OMS III; Sheldon C. Yao, DO; Theodore B. Flaum, DO; Elizabeth Caron, DO; and Michael J. Terzella, DO
New York Institute of Technology College of Osteopathic Medicine. 2013.

Editor's Note: This abstract was presented as part of the Louisa Burns Osteopathic Research Committee poster competition at the 2013 AAO Convocation in Orlando, FL.

Context

The current methods of teaching osteopathic manipulative medicine (OMM) to osteopathic medical students (OMS) may be improved by the incorporation of video learning into school curricula. Mann and Eland have demonstrated that student self-efficacy evaluations were higher with video learning and instructor feedback versus instructor demonstration and paired practice for the Spencer technique.¹ DiLullo et al have also demonstrated the use of video learning as a useful tool in anatomy dissection preparation and understanding; however, it is necessary to expand the assessment of video learning to all OMM techniques as well as the usefulness of these videos in the classroom and clinical settings in order to improve the technical skills of OMS.^{2,3}

Objectives

To measure student perception of the usefulness of OMM videos as a learning tool in the classroom and clinical setting.

Methods

The study employs an online survey to evaluate the usefulness of OMM videos to improve understanding of osteopathic treatment techniques for all current New York Institute of Technology College of Osteopathic Medicine (NYIT-COM) students in both the classroom and clinical settings. The study is conducted at the NYIT-COM in Old Westbury, NY. All current NYIT-COM students are included in the study. Any

student not currently enrolled at NYIT-COM will be excluded. Outcome measurements are based upon the interpretation of Likert scale responses by the participants of this survey.

Results

Data collection and analysis are pending. (*Editor's note: Please see AAOJ, Vol. 23, No. 3, pp. 24-30, for final analysis.*)

Conclusion

We expect the results of this study will provide information that could influence both the classroom and clinical settings. In the classroom setting, we anticipate that the use of video learning for OMM techniques will be integrated into osteopathic medical school curricula as an additional learning tool. In the clinical setting, the addition of video learning to the curriculum will also promote the use of osteopathic manipulative techniques. Additionally, the study could provide a valid rationale for offering access to OMM videos for residents and attending physicians in order to promote the use of OMM in clinical practice.

References

1. Mann, DD et al. (2005). Self-efficacy in mastery learning to apply a therapeutic psychomotor skill. *Perceptual and Motor Skills*. 2005;100: 77-84.
2. DiLullo, C. et al. (2006). Anatomy in a new curriculum: Facilitating the learning of gross anatomy using web access streaming dissection videos. *Journal of Visual Communication in Medicine*. 2006;29(3): 99-108. doi: 10.1080/01405110601080738
3. Browning, S. (2009). Teaching osteopathic students technique; using research to identify good teaching practice. *International Journal of Osteopathic Medicine*. 2009;13: 70-73. doi: 10.1015/j.ijosm.2009.10.004

BOOK SIGNINGS AT CONVOCATION

AAO Booth in the Exhibit Hall (Broadmoor Hall B)

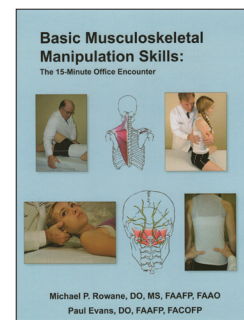
Thursday, March 20 • 9:10–9:40 am

Basic Musculoskeletal Manipulation Skills: The 15-Minute Office Encounter

Michael P. Rowane, DO, FAAFP, FAAO; Paul Evans, DO, FAAFP, FACOFP

This book is for the primary care provider who wants a basic guide to managing commonly seen clinical problems that are amenable to musculoskeletal manipulation. The assessments and techniques presented rapid, efficient, and specifically designed for use during a 15-minute office visit. Chapters include objectives, illustrative cases with answers, clear illustrations to highlight clinically important anatomic landmarks, assessment tips, treatment techniques, and key summary points.

\$99.95; 339 pp., Hardcover, ISBN: 0-940668-27-0



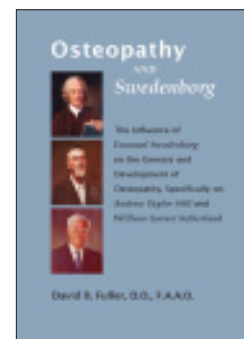
Thursday, March 20 • 4:00–4:30 pm

Osteopathy and Swedenborg: The Influence of Emanuel Swedenborg on the Genesis and Development of Osteopathy, Specifically on Andrew Taylor Still and William Garner Sutherland

David B. Fuller, DO, FAAO

This book demonstrates the influence of Swedenborg's ideas on the creation and development of osteopathic medicine, especially in regards to body/mind/spirit and the anatomical inter-relationship of the nervous system, fascia and fluids throughout the body. This includes a study of cranial osteopathy and Swedenborg's paradigm of the brain and soul-body interaction, comparing concepts such as Swedenborg's spirituous fluid and Sutherland's Primary Respiratory Mechanism. In the process, the book traces the influence of Swedenborg's ideas across 19th-c. America, specifically through the metaphysical/healing movements of transcendentalism, spiritualism, new thought and theosophy.

\$65.00; 607 pp., Hardcover, ISBN: 978-0-910557-82-5



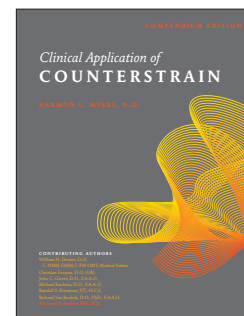
Friday, March 21 • 10:00–10:30 am

Clinical Applications of Counterstrain: Compendium Edition by Harmon L. Myers, DO

William H. Devine, DO; Christian Fossum, DO (UK); John C. Glover, DO, FAAO; Michael L. Kuchera, DO, FAAO; Randall S. Kusunose, PT, OCS; Richard L. Van Buskirk, DO, FAAO (Contributing Authors)

A powerful tool to treat chronic and acute pain, Counterstrain's gentle but logical manipulations can effect immediate, often lasting relief, and help maximize the body's natural inclination toward health. Case histories and standardized, muscle-specific treatment positions bring the author's expertise to beginners and advanced practitioners alike. In this at-a-glance presentation, Harmon L. Myers, DO, shares a lifetime of insight, and a step-by-step approach for clinicians of all disciplines to quickly and effectively diagnose and treat much of what ails us. This book is a comprehensive resource for students, instructors, clinicians and practitioners in osteopathic manipulation, physical therapy and integrated medical disciplines.

\$142.95; 234 pp., Spiral-bound, ISBN: 0978-0-9633658-1



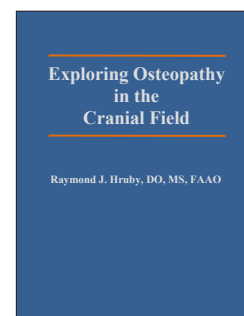
Friday, March 21 • 3:30–4 pm

Exploring Osteopathy in the Cranial Field

Raymond J. Hruby, DO, FAAO

This textbook is designed for the interested practitioner, and for the beginning to intermediate student of this topic. It can be easily used as an accompanying text or manual for a first or second course in osteopathy in the cranial field, and some topics are useful for more advanced study. It would be especially suitable for use in a 40-hour first or second level course in this topic.

\$59.95; 164 pp., Spiral-bound, ISBN: 978-0-9887511-0-1



Osteopathic Manipulation in the Treatment of Primary Nocturnal Enuresis: A Retrospective Chart Review

David M. Kanze, DO; and Kylie A. Kanze, DO

Abstract

Context

Enuresis can cause significant stress and embarrassment for children and their parents. Spontaneous resolution rates of primary nocturnal enuresis (PNE) decrease as children increase in age.

Objective

To examine the efficacy of osteopathic manipulative treatment (OMT) as a treatment for monosymptomatic PNE.

Method

A retrospective chart review was conducted of patients with a diagnosis of PNE or enuresis treated with OMT in a primary care office from September 2010 through May 2012.

Results

Charts of six patients, ages eight to 14, were included. Out of six children treated, one was lost to follow-up, one did not respond to the follow-up inquiry about participation in the study, two fully resolved and two significantly improved. Of the two who improved, one improved greatly when he finished playing football, a collision sport, for the season.

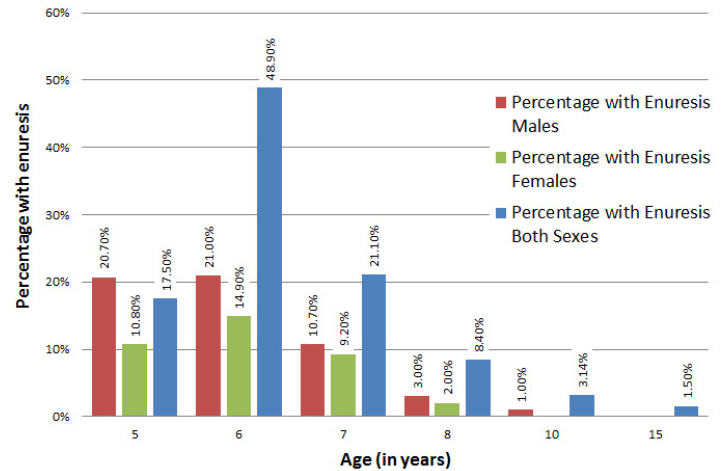
Conclusion

OMT is an effective modality to reduce or resolve enuresis in children. Due to the small sample size, the numbers are not statistically significant. However, this successful pilot study indicates the need for a study with a larger sample size to yield more information on the effectiveness of treating PNE with OMT.

Introduction

Primary nocturnal enuresis (PNE) is defined as bedwetting in a child five years or older who has not been dry overnight for a period of six or more consecutive months.^{3,11} PNE is divided into two categories, monosymptomatic and non-monosymptomatic enuresis, the latter of which will

Figure 1. Prevalence of Primary Nocturnal Enuresis



not be discussed in this study. The prevalence of PNE (Figure 1) varies slightly from country to country but is consistent as it decreases with age and is more common in boys than girls.^{3,4,7,10,11,12,14,17} On average, the yearly rate of spontaneous resolution of monosymptomatic enuresis is 15%; although this rate decreases the longer the enuresis is present.^{3,4,7,10,11,12,14,17} Bladder maturation involves autonomic and somatic nerves that synapse at multiple locations within the brain and spinal cord. Normal function includes ability to have urine storage at low pressure with high outlet resistance and voiding with low outlet resistance and sustained detrusor contraction. Newborn bladders fill without resistance, and voiding results from uninhibited contraction. This function is thought to be coordinated via the lower spinal cord and/or the brain, and thus, neurologically stimulating activities will cause voiding in this age group. Bladder capacity increases over the next three to four years in a disproportionate relationship to the surface area of the body. Bladder control is achieved slowly. The child first becomes aware of bladder filling, then gains the ability to voluntarily inhibit detrusor contractions, and lastly coordinates sphincter and detrusor function. Daytime control is usually achieved by approximately four years of age, and nighttime control usually develops months to years later but is expected by five to seven years of age. Causes of

PNE include one or a combination of the following: maturational delay, genetics, small bladder capacity, nocturnal polyuria, abnormal secretion of antidiuretic hormone (ADH), abnormal detrusor activity, disturbed sleep and/or psychological disorders.¹⁵

Standard treatment for PNE includes motivational therapy including smile/star charts, bladder training, alarms, dry-bed training, biofeedback and medication, including but not limited to DDAVP (desmopressin).^{1,10,17} If standard and complementary treatments fail, or if there is a suggestion of an organic or psychological cause for PNE, the child can be referred to the appropriate specialist. Guidelines for referrals to a pediatric urologist come from a myriad of sources.¹⁰ Referral to a pediatric urologist should be considered if any of the following conditions exist or are suspected: Type 1 diabetes mellitus, constipation, urinary tract infection, developmental delay, emotional problems, psychological problems, learning difficulties or recurrent enuresis. Comorbidities for PNE include decreased weight, decreased growth, shorter stature, anxiety, interpersonal conflicts with parents, siblings and peers, and the stigma of being a bed wetter, especially in older children and adolescents.^{1,7,10} We hypothesize that OMT can be an effective, complementary treatment option for children.

Methods

Following institutional review board approval, a retrospective chart review was conducted on patients seen at Rocky Vista Health Center (RVHC) in Parker, CO, from September 2010 through May 2012 who had the diagnosis of PNE and received OMT. The charts of six children were reviewed by two osteopathic physicians, a pediatrician and a family practice/neuromuscular medicine specialist for information pertaining to the diagnosis, the treatment modalities and the subjective effectiveness of such treatment. Many of these patients presented to the clinic for standard pediatric care or for OMT of other body regions. Several of the patients were on the standard

regimen of DDAVP (desmopressin), nighttime fluid restriction and bed wetting alarms, or a combination thereof. None had received OMT in the past. No specific OMT protocol was followed, as the treatment plan was individualized for each patient. The children ranged in age from eight to 14 years, one girl and three boys, three of whom were Caucasian and one was of mixed race. The number of OMT treatments ranged from three to 15 sessions over a period of five to 12 months, with an average of seven treatment sessions per patient (Chart 1). Based on findings determined during the session's examination and assessment, OMT was applied to each patient's regions requiring treatment. The most common areas treated were the pelvis, sacrum, thoracic spine and lumbar spine. The most common technique utilized was ligamentous articular strain. Other areas addressed included the cranium, to help treat the parasympathetic control to the kidneys via the vagus nerve; the sacral plexus via the sacrum, to address the parasympathetic control to the bladder itself; and the rib heads and thoracic and lumbar vertebrae from T10 to L2, which regulate sympathetic control to the kidneys, ureters and urinary bladder respectively.

Results

Charts from six patients, ages eight to 14, with a diagnosis of PNE who were treated with OMT, were included in the retrospective analysis. Of the six children treated, one was lost to follow-up, one did not respond to the inquiry about participation in the study, two fully resolved and two significantly improved, one of which improved greatly when he was finished playing football, a collision sport, for the season.

Discussion

There are multiple studies on many of the treatment modalities mentioned above with varying results. There is little research published on manual therapies for PNE itself. Two were found during a review of the literature, one a study by a German osteopath on OMT for enuresis¹¹ and the other a study using Osteopathically-based manual physical therapy for pediatric dysfunction voiding.⁸ Both studies, of small sample size, show symptomatic improvement. These studies combined with this chart review should provide a foundation for a larger, multicenter clinical trial of OMT for primary nocturnal enuresis.

Chart 1. Treatments and results by patient.

Effectiveness of OMT in Nocturnal Enuresis			
Patient	Number of Treatments	Outcome	Time Frame
ZP	5	Symptoms Resolved	7 months
HL	3	Symptoms Improved	12 months
NK	15	Symptoms Resolved	12 months
TW	7	Symptoms Improved	5 months

Conclusion

This retrospective chart review suggests OMT may be an effective treatment for children with PNE, augmenting the benefits of conventional medication and behavioral management of monosymptomatic enuresis. Further study with a larger sample size would yield more information regarding the usefulness of OMT in treating PNE.

Acknowledgements

Thank you to Frank Ritchel Ames, PhD; Jason Wells, PhD; Jill Pitcher, DO; Amber Heck, PhD; and Kay Kelts, OMS V, for their assistance.

References

1. Ramakrishnan K. Evaluation and Treatment of Enuresis. *American Family Physician*. Aug. 15, 2008; 78(4): 489-496.
2. Makari J, Rushton HG. Nocturnal Enuresis. *American Family Physician*. 2006; 73(9): 1611-1614.
3. Cendron M. Primary Nocturnal Enuresis: Current Concepts. *American Family Physician*. 1999; 59(5): 1205-1214.
4. Yeung CK, Sneedhar B, Sihoe JD, et al. Differences in characteristics of nocturnal enuresis between children and adolescents: a critical appraisal from a large epidemiological study. *BJU International*. 2005; 97, 1069-1073.
5. Willard F. Autonomic Nervous System. In: Chila, AG, executive editor. *Foundations of Osteopathic Medicine*. 3rd Edition. Baltimore, MD: Lippincott, Williams and Wilkins; 2011: 136-140.
6. Carine A, Mills M, Frymann V. A Pediatric Perspective on Osteopathic Medicine. In: Culbert T and Olness K, executive editors. *Integrative Pediatrics*. 1st Edition. New York, NY: Oxford Press; 2010: 340-366.
7. Ghahramani M, Mahdi B, Ghahramani AA. Nocturnal Enuresis and its Impact on Growth. *Iran Journal of Pediatrics*. 2008; 18 (2): 167-170.
8. Franke H, Hoesel K. Osteopathic manipulative treatment (OMT): for lower urinary tract symptoms (LUTS) in women; *Journal of Bodywork and Movement Therapies*. 2013; 17(1): 11-18.
9. Nemett DR, Fivush BA, Matthews R, et al. A randomized controlled trial of the effectiveness of osteopathy-based manual physical therapy in treating pediatric dysfunctional voiding. *Journal of Pediatric Urology*. 2008; 4: 100-106.
10. Nocturnal enuresis in children and young people: NICE clinical guideline. *National Institute for Health and Clinical Excellence*. London, England. October 2010.
11. Kargl D. *Osteopathy with Enuresis*. (Germany).
12. Foxman B, Valdez RB, Brook RH. Childhood Enuresis: Prevalence, Perceived Impact, and Prescribed Treatments. *Pediatrics*. 1986; 77(4): 482.
13. Robson WL, Leuing AK, Van Howe R. Primary and Secondary Nocturnal Enuresis: Similarities in Presentation. *Pediatrics*. 2005; 115(4): 956-959.
14. Hazza I. Primary Nocturnal Enuresis among School Children in Jordan. *Saudi Journal of Kidney Disease and Transplantation*. 2002; 13(4): 478-480.
15. Tu ND, Baskin LS, Arnhym AM. Etiology and evaluation of nocturnal enuresis in children. *UpToDate*. Dec. 4, 2012. Accessed March 28, 2013.
16. Nepple KG, Cooper CS. Evaluation and diagnosis of bladder dysfunction in children. *UpToDate*. May 13, 2013. Accessed May 28, 2013.
17. Tu ND, Baskin LS. Management of nocturnal enuresis in children. *UpToDate*. December 15, 2012. Accessed March 28, 2013.

AAOJ Submission Checklist

Manuscript Submission

- Submission emailed to AAOJ Scientific Editor at edito-raaoj@gmail.com or mailed on CD-ROM to the AAOJ Managing Editor, American Academy of Osteopathy, 3500 DePauw Boulevard, Suite 1100, Indianapolis, IN 46268
- Manuscript formatted in Microsoft Word for Windows (.doc), text document format (.txt) or rich text format (.rtf)

Manuscript Components

- Cover letter addressed to the AAOJ Scientific Editor, Kate McCaffrey, DO, with any special requests (e.g., rapid review) noted and justified
- Title page, including the authors' full names and financial or other affiliations, as well as disclosure of the financial support related to original research described in the manuscript
- "Abstract" (see "Abstract" section in "AAOJ Instructions for Contributors" for additional information)
- "Methods" section
 - the name of the public registry in which the trial is listed, if applicable
 - ethical standards, therapeutic agents or devices, and statistical methods defined
- Four multiple-choice questions for the continuing medical education quiz and brief discussions of the correct answers
- Editorial conventions adhered to
 - units of measure given with all laboratory values
 - on first mention, all abbreviations other than measurements placed in parentheses after the full names of the terms, as in "American Academy of Osteopathy (AAO)"
- Numbered references, tables and figures cited sequentially in the text
 - journal articles and other material cited in the "References" section follow the guidelines described in the most current edition of the *AMA Manual of Style: A Guide for Authors and Editors*.
 - references include direct, open-access URLs to posted, full-text versions of the documents
 - photocopies provided for referenced documents not accessible through URLs

- "Acknowledgements" section with a concise, comprehensive list of the contributions made by individuals who do not merit authorship credit and permission from each individual to be named in print
- For manuscripts based on survey data, a copy of the original validated survey and cover letter

Graphic Elements

- Graphics should be formatted as specified in the "Graphic Elements" section of "AAOJ Instructions for Contributors"
- Graphics should not be included with text but sent as separate graphic files (e.g. jpg, tiff, pdf)
- Each graphic element cited in numerical order (e.g., *Table 1*, *Table 2*, and *Figure 1*, *Figure 2*) with corresponding numerical captions in the manuscript
- For reprinted or adapted tables, figures and illustrations, a full bibliographic citation given, providing appropriate attribution

Required Legal Documentation

- For reprinted or adapted tables, figures and illustrations, permission to reprint from the publisher in the AAOJ print and online versions accompanied by photocopies of the original work
- For photographs in which patients are featured, signed and dated "Patient-Model Release" forms submitted
- For named sources of unpublished data and individuals listed in the "Acknowledgments" section, permission to publish their names in the AAOJ obtained.
- For authors serving in the U.S. military, the armed forces' approval of the manuscript and institutional or military disclaimers submitted

Financial Disclosure and Conflict of Interest

Authors are required to disclose all financial and non-financial relationships related to the submission's subject matter. All disclosures should be included in the manuscript's title page. See the "Title page" section of "AAOJ Instructions to Contributors" for examples of relationships and affiliations that must be disclosed. Those authors who have no financial or other relationships to disclose must indicate that on the manuscript's title page (e.g., "Dr Jones has no conflict of interest or financial disclosure relevant to the topic of the submitted manuscript").

Publication in JAOA

Please include permission to forward all manuscripts to the *Journal of the American Osteopathic Association* if the Editor deems a manuscript not suited to the current needs of the AAOJ.

Questions? Contact Dr. Kate McCaffrey, Scientific Editor, at kmccaffrey@westernu.edu.

Component Societies and Affiliated Organizations Calendar of Upcoming Events

April 10-13, 2014

Orthopedic Neurology

Course Director: Maurice Bensoussan, MD, DO, FCA
Associate Director: R. Paul Lee, DO, FAAO, FCA
Doubletree San Francisco Airport Hotel, Burlingame, CA
Phone: (317) 581-0411 Fax: (317) 580-9299
Email: info@cranialacademy.org
Website: www.cranialacademy.org

April 30–May 3, 2014

*Pennsylvania Osteopathic Medical Association
106th Annual Clinical Assembly and Scientific Seminar*
Valley Forge Convention Center, King of Prussia, PA
CME: 34 Category 1-A and 6 Category
1-B AOA credits anticipated
Phone: (800) 544-7662 Fax: (717) 939-7255
Email: poma@poma.org
Website: www.poma.org

May 1, 2014

*Indiana Academy of Osteopathy Preconference OMT
Workshop: “The Principles of Muscle Energy Diagnosis”*
French Lick Resort, French Lick and West Baden, IN
CME: 8 Category 1-A hours anticipated
Phone: (317) 926-3009
Website: www.inosteo.org

May 2 - 4 2014

Indiana Osteopathic Association 117th Annual Convention
French Lick Resort, French Lick and West Baden, IN
CME: 25 Category 1-A hours anticipated
Phone: (317) 926-3009
Website: www.inosteo.org

May 8–10, 2014

*The American Osteopathic Association of Prolotherapy
Regenerative Medicine’s Spring 2014 Training Seminar*
Marriott Country Club Plaza, Kansas City, MO
CME: 34 Category 1-A AOA credits anticipated
Phone: (302) 530-2489
Email: lindapavina@verizon.net
Website: www.prolotherapycollege.org/Training.html#Fall

May 14-17, 2014

*Michigan Osteopathic Association 115th Annual Spring
Scientific Convention COBO Center, Detroit, MI*
CME: 30 Category 1-A Credits Anticipated
(1 hour for AOBNMM)
Phone: (800) 657-1556
<https://www.mi-osteopathic.org/2014SpringConvocation>

June 14-18, 2014

June Introductory Course in Osteopathy in the Cranial Field
Course Director: Eric J. Dolgin, DO, FCA
Sheraton Indianapolis City Centre, Indianapolis, IN
Phone: (317) 581-0411 Fax: (317) 580-9299
Email: info@cranialacademy.org
Website: www.cranialacademy.org

June 19-22, 2014

*Osteopathic Cranial Academy Annual Conference: Beyond
Sutherland’s Minnow: Anatomy, Perception and Treatment*
Conference Director: Melvin R. Friedman, DO
Sheraton Indianapolis City Centre, Indianapolis, IN
Phone: (317) 581-0411 Fax: (317) 580-9299
Email: info@cranialacademy.org
Website: www.cranialacademy.org

July 14–July 18, 2014

*Expanding Osteopathy into the Cranial
Field: Viola M. Frymann Basic Course*
Program Chair: Ray Hruby, DO
American Academy Of Pediatric Osteopathy with
Osteopathy’s Promise to Children, San Diego, CA
CME: 40 Category 1-A AOA credits anticipated
Website: www.the-promise.org

July 19–21, 2014

Intensive Course in Pediatric Osteopathy
Program Chair: Shawn K. Centers, DO
American Academy Of Pediatric Osteopathy with
Osteopathy’s Promise To Children, San Diego, CA
CME: 24 Category 1-A AOA credits anticipated
Website: www.the-promise.org