THE AAO
JOURNAL
FORUM FOR OSTEOPATHIC THOUGHT
A Publication of the American Academy of Osteopathy
TRADITION SHAPES THE FUTURE • VOLUME 12 NUMBER 3 FALL 2002

The complexities of the Spine

see page 17 . . .

Instructions to Authors

The American Academy of Osteopathy (AAO) Journal is a peer-reviewed publication for disseminating information on the science and art of osteopathic manipulative medicine. It is directed toward osteopathic physicians, students, interns and residents and particularly toward those physicians with a special interest in osteopathic manipulative treatment.

The AAO Journal welcomes contributions in the following categories:

Original Contributions
Clinical or applied research, or basic science research related to clinical practice.

Case Reports
Unusual clinical presentations, newly recognized situations or rarely reported features.

Clinical Practice
Articles about practical applications for general practitioners or specialists.

Special Communications
Items related to the art of practice, such as poems, essays and stories.

Letters to the Editor
Comments on articles published in *The AAO Journal* or new information on clinical topics. Letters must be signed by the author(s). No letters will be published anonymously, or under pseudonyms or pen names.

Professional News of promotions, awards, appointments and other similar professional activities.

Book Reviews
Reviews of publications related to osteopathic manipulative medicine and to manipulative medicine in general.

Note
Contributions are accepted from members of the AOA, faculty members in osteopathic medical colleges, osteopathic residents and interns and students of osteopathic colleges. Contributions by others are accepted on an individual basis.

Submission
Submit all papers to Anthony G. Chila, DO, FAAO, Editor-in-Chief, Ohio University, College of Osteopathic Medicine (OUCOM), Grosvenor Hall, Athens, OH 45701.

Editorial Review
Papers submitted to *The AAO Journal* may be submitted for review by the Editorial Board. Notification of acceptance or rejection usually is given within three months after receipt of the paper; publication follows as soon as possible thereafter, depending upon the backlog of papers. Some papers may be rejected because of duplication of subject matter or the need to establish priorities on the use of limited space.

Requirements for manuscript submission:

Manuscript
1. Type all text, references and tabular material using upper and lower case, double-spaced with one-inch margins. Number all pages consecutively.

2. Submit original plus three copies. Retain one copy for your files.

3. Check that all references, tables and figures are cited in the text and in numerical order.

4. Include a cover letter that gives the author's full name and address, telephone number, institution from which work initiated and academic title or position.

5. Manuscripts must be published with the correct name(s) of the author(s). No manuscripts will be published anonymously, or under pseudonyms or pen names.

6. For human or animal experimental investigations, include proof that the project was approved by an appropriate institutional review board, or when no such board is in place, that the manner in which informed consent was obtained from human subjects.

7. Describe the basic study design; define all statistical methods used; list measurement instruments, methods, and tools used for independent and dependent variables.

8. In the "Materials and Methods" section, identify all interventions that are used which do not comply with approved or standard usage.

Computer Disks
We encourage and welcome computer disks containing the material submitted in hard copy form. Though we prefer Macintosh 3-1/2" disks, MS-DOS formats using either 3-1/2" or 5-1/4" discs are equally acceptable.

Abstract
Provide a 150-word abstract that summarizes the main points of the paper and it's conclusions.

Illustrations
1. Be sure that illustrations submitted are clearly labeled.

2. Photos should be submitted as 5" x 7" glossy black and white prints with high contrast. On the back of each, clearly indicate the top of the photo. Use a photocopy to indicate the placement of arrows and other markers on the photos. If color is necessary, submit clearly labeled 35 mm slides with the tops marked on the frames. All illustrations will be returned to the authors of published manuscripts.

3. Include a caption for each figure.

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References
1. References are required for all material derived from the work of others. Cite all references in numerical order in the text. If there are references used as general source material, but from which no specific information was taken, list them in alphabetical order following the numbered journals.

2. For journals, include the names of all authors, complete title of the article, name of the journal, volume number, date and inclusive page numbers. For books, include the name(s) of the editor(s), name and location of publisher and year of publication. Give page numbers for exact quotations.

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American® Academy of Osteopathy

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THE AAO FORUM FOR OSTEOPATHIC THOUGHT

JOURNAL

A Publication of the American Academy of Osteopathy

TRADITION SHAPES THE FUTURE • VOLUME 12 NUMBER 3 FALL 2002

The mission of the American Academy of Osteopathy is to teach, advocate, advance, explore, and research the science and art of osteopathic medicine, emphasizing osteopathic principles, philosophy, palpatory diagnosis and osteopathic manipulative treatment in total health care.

Editorial Section

Peer-Reviewed Section

Component Societies' CME Calendar

and other Osteopathic Affiliated Organizations

October 11-13
Continuing Studies Course: Pathways to Diagnosis
Sutherland Cranial Teaching Foundation
UNECOM, Biddeford, ME
Hours: 18 Category 1A
Contact: SCTF
(817) 926-7705

November 1-4
Biodynamics Phase I
Stefan Hagopian, DO
Topanga, CA
Hours: 26 Category 1A
Contact: James Jealous, DO
(207) 778-9847

November 8-10
Neurofascial Release Conference
Stephen Davidson, DO, CSPOMM
see note in website Healthabounds2.com
Arizona Academy of Osteopathy
West Hartford, CT
Hours: 24 Category 1A
Contact: Stephen Shifreen, MD
(860) 570-3400 or
Stephen Davidson, DO
(800) 359-7772

November 15-17
Experiencing Osteopathy
Bonnie Gintis, DO
Santa Cruz, CA
Hours: 15.5 Category 1A
Contact: Bonnie Gintis, DO
(831) 477-1200

November 16-18
Studies in Osteopathy
Westerland Group Study/Claire Galin, DO
Pecos, NM
Hours: 24 Category 1A
Contact: Claire Gallin, DO
(505) 471-3292

November 16-19
Biodynamics Phase II
James Jealous, DO
Sugar Hill, NH
Hours: 24.5 Category 1A
Contact: James Jealous, DO
(207) 778-9847

November 22-25
Biodynamics Phase III
James Jealous, DO
Sugar Hill, NH
Hours: 22 Category 1A
Contact: James Jealous, DO
(207) 778-9847

November 24-26
Principles of Manual Medicine in Physical Medicine and Rehabilitation
American Academy of Physical Medicine & Rehab/Jerel Glassman, DO
Orlando, FL
Hours: 22 Category 1A
Contact: Jerel Glassman, DO
(312) 464-9700

December 6-8
21st Annual Winter Update
Indiana Osteopathic Association
Indianapolis, IN
Hours: 20 Category 1A
Contact: IAO
317/926-3009

2003
February 26 - March 2
Midwinter Basic Course
The Cranial Academy
AZCOM
Phoenix, AZ
Hours: 40 Category 1A (anticipated)
Contact: The Cranial Academy
317/594-0411

June 9-10
*Addressing Medical Issues Conference: *OIG Compliance, *Stark Rules, *HIPPA Regulations, *Center for Medicare and Medicaid.*
Pinellas County Osteo Medical Society
Las Vegas, NV
Hours: 12
Contact: Kenneth E. Webster, EdD
717/581-9069

June 14-18
Basic Course
The Cranial Academy
Founders Inn
Virginia Beach, VA
Hours: 40 Category 1A (anticipated)
Contact: The Cranial Academy
317/594-0411

June 19-22
Annual Conference
The Cranial Academy
Founders Inn
Virginia Beach, VA
Hours: 40 Category 1A (anticipated)
Contact: The Cranial Academy
317/594-0411

October 10-13
Research Symposium/SCTF Continuing Studies Program
Indian Lakes Resort
Bloomingdale, IL
The Cranial Academy
Contact: The Cranial Academy
317/594-0411

View from the Pyramids

Lightning Bonesetter

In her 1991 biography of Andrew Taylor Still, Carol Trowbridge[1] made reference to Still's incorporation of the ancient art of bonesetting into his practice by the year 1883. It is commented that from that year until about 1890, Still advertised himself as the "Lightning Bone Setter". The source of Still's knowledge of bonesetting is said to be obscure. In this issue (see *From the Archives)* a representation of the bonesetter's art is given through the work of George Matthews Bennett.

The Art of the Bonesetter (1884) was republished as a first new edition in 1981, copyrighted by Peter Hawkins. The following selected citations from Hawkins' *Preface To New Edition* will complement *From the Archives:*

"In 1884 George Matthews Bennett had been in practice as a bonesetter for nineteen years. At one time attending, on alternate days, practices in London and Leamington; at another period in his career with concurrent practices in Leamington, Rugby, Coventry, and Stratford; he was both in high demand, and exceedingly hardworking.

He was a descendent of the famous Matthews family on his maternal side and carried on their long tradition of bonesetting in the Midlands, there having been Matthews bonesetters in that region for almost two hundred years. He was succeeded in practice by his son, of the same name, whose eventual retirement ended the family tradition of bonesetting.

I have been able to contact three people who remember receiving treatment at the hands of GMB. The dexterity of his methods, his alertness in execution, and his innumerable surprises in manual treatment were apparently remarkable. At times a briefly, and on occasions gruffly given command to the patient was, as often as not, the forerunner to the deft action by which Mr. Matthews Bennett reduced the fractured bone, or pulled the displaced or subluxed joint into position. The shock engendered was usually justified by the result, and the incident, all too often went on to form the core of a pleasant anecdote in after years.

The author appeared equally well liked and respected by his poorer patients, being something of a Robin Hood in bonesetting. In politics a Liberal, in religion a staunch member of the Church of England; his hectic professional schedule did not prevent him being a Freemason, a Druid, a Forester, and a keen sportsman, riding in all for over thirty years with the North Warwickshire Hunt.

By the time of his death in 1913, he had become something of a local institution, and the loss to his patients at that time was smoothed by the equal ability of his son, whose training as always had been gained at the hands, and at the side of his father.

Here then is a book written a century ago, and just ten years after the inception of Osteopathy in the states, where A.T. Still was only beginning to develop and teach his revolutionary new approach to the art of healing.

If one can exclude for a moment the self-centred style already mentioned, this small volume presents a wonderful insight into the thoughts and feelings of a British heterodox practitioner of the Victorian era.

It is important to realize that the transition from the bonesetter to the Osteopathic practitioner of today, was not smooth or continuous. The new thinking from across the Atlantic arrived not as a group of techniques, but as a completely new diagnostic and therapeutic approach to musculoskeletal conditions.

It came at a time when orthodox medicine was fast advancing and overtaking any work the bonesetter did in handling the reduction of fractures, using both open and closed methods under anaesthesia.

The bonesetter's emphasis was upon dislocations, joint strains, and fractures, especially peripherally. Ours is upon the more subtle forms of postural and occupational imbalances producing the sometimes insidious, but nevertheless equally incapacitating present day conditions.

Whilst this difference may be readily apparent within our practices, it is perhaps too fine to be recognized by those not involved in the treatment of musculo-keletal disorders, - and one not even considered by the general public, who still view Osteopathy as a logical progression of bonesetting.

As we proceed with the day to day management of our patients and practices it can sometimes be difficult to see the developments with a longer term view, concentrating as we do, on modern methods and attitudes. In doing so, we must not let the memory of these people slip into oblivion. Regardless of where they now rest, here is their monument and their memorial; here they live on."

The lessons of history are fascinating.

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1. Trowbridge, C. Andrew Taylor Still: 1828-1917. The Thomas Jefferson University Press, 1991; 136.

Anthony G. Chila D.O., FAAO

Contributors

Capobianco, JD, Protopapas, MG and Rivera-Martinez, S. *Motion Characteristics of a Typical Cervical Vertebral Unit: A palpatory Diagnosis of Rotation and Sidebending of C3-4.*

This paper analyzes the validity of Fryette's theory of spinal motion. Specific testing of motion of the third cervical vertebra in relation to the fourth cervical vertebra was done. 289 asymptomatic adult volunteers were recruited for this study. The authors report that coupling occurred at a lesser frequency than would have been predicted by Fryette's view that rotation and sidebending will occur to the same side in a typical cervical segment. It was also observed that repeated passive motion testing affected interexaminer reliability.

Scariati, PD. *Digging On: Some thoughts on the integration of Russellian Cosmology and Osteopathy.*

The author provides a review of the work of Lao and Walter Russell whose teaching and writing effort sought to assist man in the unfolding of his higher Self. Their home study course (Universal Law, Natural Science and Living Philosophy: A Home Study Course of the Science of Man. 1951, 1957, 1962 and 1972. University of Science and Philosophy, Blacksburg, Virginia.) provides a basis for expansion of osteopathic thought. Selected comments from the course are discussed and references provided.

Mitra, MM, Stoll, ST. *Post-traumatic Headache of Cervical Origin.*

This case study notes that headache associated as an immediate consequence of head trauma is often of short duration. Chronic post-traumatic headache is noted to persist for months or years after trauma. The anatomic basis, pathology and differential diagnosis of cervicogenic headache are reviewed. Pharmacologic treatment and osteopathic manipulative treatment are discussed.

Regular Features

Dig On. The Eduational Council on Osteopathic Principles and Practice (ECOP) met at the Pikeville College School of Osteopathic Medicine (PCSOM) from September 12-14, 2002. A rare moment occurred when Robert C. Davis, PhD, Associate Professor, Division of Humanities, was introduced by Edward G. Stiles, DO, FAAO, Professor and Chair of OPP at PCSOM. Doctor Davis reviewed the conceptual world of Andrew Taylor Still by providing a critique of the 1991 biography authored by Carol Trowbridge.

From the Archives. The work of a nineteenth-century English Bone-Setter is reviewed through the work of George Matthews Bennett. A member of a family whose bone-setting practice spanned nearly 200 years in the Midlands of England, Bennett began practice in 1865. At the time of his death in 1913, his practice was carried on by his son, whose eventual retirement ended the family tradition.

New to this issue of the ***AAOJ*** is a page which looks elsewhere to observe and comment on publications which may be of interest to the reading audience. Many journals are in print which reflect the numerous current expressions of health care practice having a manual arts focus.

Elsewhere in Print will offer selections from various journals when review indicates that authors cite publications by American osteopathic physicians. This inaugural offering includes: *Journal of Osteopathic Medicine* (an official journal of the Australian Osteopathic Association, General Osteopathic Council (UK), New Zealand Register of Osteopaths, Australian Student Osteopathic Medical Association); *JNMS: Journal of the Neuromusculoskeletal System* (A Journal of the American Chiropractic Association); *AK: The International Journal of Applied Kinesiology and Kinesiologic Medicine*.❐

Author's Correction:

Somehow in my researching, I had erroneously been lead to believe Leon Chaitow, ND, DO, had passed on. However, it has been three or four years since the writing of the Fellowship paper and I have corresponded with the man, forgetting about the reference in the paper. He is alive and active. He publishes profusely and is the editor of *The Journal of Bodywork and Movement Therapies*.

Zachary Comeaux, DO, FAAO

The AAO Journal, Volume 12, No. 2, Summer 2002, pp 24-35

Letter to the Editor

RE: "Spirtuality and the Teaching of Spirituality in an Osteopathic Medical Curriculum" by Willliam W. Lemley, DO, FAAO

Volume 12, Number 2, Summer 2002, The AAO Journal

Dear Dr. Chila,

We would like to respond to your offer to use *The AAO Journal* as a forum for osteopathic thought. In particular, we would like to offer some additional perspectives to the important article by William Lemley, DO on spirituality in your summer 2002 issue.

While Lemley mostly discussed religious/spiritual *beliefs*, we suggest adding to the curriculum some insights into an underlying sense of *spirit* from A.T. Still and other health professionals. Lemley seemed to use *spirit* and *life* interchangeably when quoting from Still. Indeed, there are only a few specific references to *spirit*, but a key one is:

> *We want to inform ourselves on that before we take hold of a man that has an enlarged liver (for example), because on that inner man depends the results . . . The spirit is the man, the inner man of whom I am talking.*
>
> Body and Soul of a Man, 1902

The above suggests a fundamental sense of *spirit*. In recent years, the part played by the *spirit* in healthcare has been found to be so profound that we felt compelled to suggest a central focus on this "inner person."

Cora Barden, DO, among others, has related that physicians should link the *mind* with conscious psychology and the *spirit* with the underlying, unconscious psychology within a person (1951). Additionally, the unconscious mind (spirit) is believed to control the autonomic nervous system while the conscious mind controls the voluntary nervous system. Further, J. Stedman Denslow, DO, and Irvin Korr, PhD, of Kirksville detected various autonomic muscular responses in patients at rest when disturbed by emotionally stimulating inputs (1978). Thus, there is empirical evidence demonstrating that the conscious mind seems to be able to communicate with this unconscious mind. For example, during the birth of a child, an expectant mother can affect her physiology through training in attitudes and behaviors. According to this view, belief or faith, is the assent by the unconscious mind to what has been declared by the conscious mind to be true. Thereby, the unconscious mind or spirit may come to believe a repeated, authoritative, or emotional affirmation. Accordingly, there can be healthy thoughts or unhealthy thoughts that affect our beliefs and inner spirit in one way or the other.

Thoughts like hope, confidence, and determination can be transmitted to the spirit of the patient, with or without a religious context. The *end* is to develop good attitudes; the *means* can be through a dialogue between the doctor and patient, a minister and parishioner, or a group leader and a support-group. The goal is to maintain a healthy spirit and thereby allow the autonomic nervous and immune systems to function properly.

The effects of the underlying spirit or subconscious have actually been discussed for several centuries. Hippocrates and Galen linked the humors or attitudes of patients with various kinds of maladies. In 1759, Richard Guy, MD wrote that women with cancer tend to be "of a sedentary melancholic disposition of mind." In 1870, James Paget, MD described cancer pre-dispositions as "deep anxiety, deferred hope, or disappointment." In the last few decades, George Vaillant, MD has been reporting on a group of Harvard graduates and has found that those that stayed healthy had good attitudes. Recent studies of rheumatoid arthritis, lupus, and other autoimmune disorders show that the worse the disposition or spirit, the weaker the immune system.

Therefore, we assert that the concept of spirit, or the unconscious mind, or whatever you want to call it, is important *in understanding a patient*. Recognizing these spiritual, and sometimes unconscious, dimensions of a person is also essential *if we want to teach medical students to use the spirit in a positive way* to allow the mind, body, and spirit to establish an integrated, healthy *structure* and thereby enable healthy *functioning*.

We have a few other, minor suggestions regarding Lemley's article. We did not see an objective basis for the references to Sutherland. We suggest that religion is *a* bridge, not *the* bridge, to the spiritual. We suggest

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dropping the undiscriminating sentence "Body was mind and mind was spirit." The section on quantum physics is theoretically misleading and unnecessary. The sentence attributed to Sutherland on transmutation between the Breath of Life and physical matter is scientifically embarrassing as is the sentence on the flows through the electro-magnetic field of the body. In general, just as A.T. Still dropped the concept of "magnetic flows" when he realized he could substitute real flows in the circulatory and nervous systems, we suggest that we might be able to drop concepts about "spiritual energy, etc." when we realize the explanatory power of underlying, physically based, driving forces.

Lastly, while we believe all health practitioners need to understand the role of spirit *and* belief in the functioning of the autonomic (and hence healing) systems, we are not sure that they should be "mobilizing support" of patients and friends to pray for deliverance from sickness. Theologians have been debating for centuries whether or not it is appropriate to ask God to intervene (work a miracle) and alter His natural laws for one individual's benefit. The theological argument against this is that we would be asking God to do our will instead of trying to follow the will of God.

In summary, Dr. Lemley is to be congratulated for discussing these important topics. We hope he, and others, will agree that the conscious-unconscious interactions and their psychoneuroimmunologic reactions are also important to include in the osteopathic medical curriculum. We also hope that the "forum" will continue and that others will improve our language and frameworks and thereby continue to fan our humble embers into a great fire of widespread discussion.

We believe that the analysis of the *interactions* of the mind, body, and spirit is a critical component for opening the long-awaited flowering of osteopathic medicine.

James J. McGovern, PhD,
President
Kirksville College of Osteopathic Medicine
and Rene J. McGovern, PhD,
Associate Professor,
Neuro-behavioral Sciences, KCOM
Adjunct Asst. Prof. of Psychology,
Psychiatry and Neurology,
Case Western Reserve University

Dr. Lemley Responds

The author would like to thank Drs. McGovern for their informative comments about the "inner person" and powers of the unconscious mind. Psychoneuroimmunology indeed fits naturally into any consideration of spirituality and, in fact, might be considered the basic science of spirituality. Although we speak of mind, body and spirit as distinct entities, it is the author's opinion that Dr. Still viewed them as an inseparable, unified organism. This correlates with the shamanistic view that any distinction of the three is illusory. The references to quantum physics were intentionally general and brief due to the scope of the paper. The discussion of the parallels between the holistic nature of osteopathic philosophy and the interrelationships of matter in quantum theory was intended to clarify the unified nature of human beings in their universe. Dr. Still, after all, did describe human beings as a miniature universe.[1] He speaks of life as a substance, both subtle and powerful, that engenders motion everywhere, and said we may "look for life to appear when the proper connection is made."[2] To Dr. Still, life was more than just an organizing principle. It was seen as an animating force made only of living substance capable of existing apart from the organism.[3] This interpretation corresponds to Dr. Sutherland's metaphorical references to the Breath of Life, an inherent healing force with a tendency towards normalcy. The author does not consider Dr. Sutherland's references to the Breath of Life as "scientifically embarrassing," but then one may suppose that many scientific pioneers from Galileo to Einstein were considered "scientifically embarrassing" in their own time until the truth of their theories became apparent. Dr. Sutherland used metaphor eloquently to explain a spiritual concept. The metaphor simply clarifies a healing phenomenon which is experiential in nature and very difficult to verbalize. With experience, the perceptive field of the osteopath shifts as he or she evolves mentally, psychologically and spirituality. The metaphorical then becomes literal on a new plane of understanding.[4]

The author recommended that students be taught to comfortably explore a patient's spiritual nature by several means, one of which was "knowing when to mobilize support of the spiritual community or support groups for their patients." Drs. McGovern equate this with praying for deliverance from sickness. Prayer is but one example; most of the literature reviewed by the author on the positive aspects of prayer involved not asking God to alter His natural laws but instead involve prayers for healing invoking the inflow of Divine love and wisdom or "Thy will be done." Other appropriate examples of mobilizing spiritual support would include the physician serving as a liaison between patient and chaplain, identifying support groups from cancer survivors, assisting in end-of-life issues, etc. The purpose of the paper was to encourage open dialogue of

spiritual issues as they relate to the practice of osteopathic medicine. Spirituality is a deeply personal, controversial and pertinent topic for discussion in medical education. I appreciate the insights of Drs. McGovern, and would encourage all osteopathic educators to discuss spiritual issues with their colleagues and students.

William Lemley, DO, FAAO

1. Still, A. *Autobiography of Andrew Taylor Still*, rev. ed. Kirksville, MO. Published by the author. 1908. Distributed, Indianapolis, IN. American Academy of Osteopathy; 1996: p. 333.

2. Still, A. *Osteopathy Research and Practice*. Kirksville, MO. Published by the author; 1917: Distributed, Seattle, WA. Eastland Press; 1992: pp. 278-79.

3. Masseillo, D. Osteopathy - a philosophical perspective; reflections on Sutherland's experience with the tide. *The AAO Journal*. Summer 1999: pp. 21-39.

4. Ibid., pp. 21-39.❐

Calendar of Events

December 6-8, 2002
Basic Concepts in Muscle Energy
Walter Ehrenfeuchter, DO, FAAO,
Program Chairperson
Mesa, AZ

Preview of 2003 Courses

January 16-19
Manual Medicine/Manipulation for Physicians: Lower Back, Pelvis and Lower Extremities
in San Antonio, TX

February 6-9
Diagnosis and Treatment of Low Back Pain and Introduction to Prolotherapy
in Santa Rosa, CA

March 17-19
Visceral Manipulation: Manual Thermal Diagnosis
in Ottawa, Ontario, Canada

March 19-23
2003 Annual Convocation: Education and Research: The Backbone of Osteopathy
in Ottawa, Ontario, Canada

April 26-27
Dr. Fulford's Basic Percussion Technique
in Chicago, IL

May 2-4
Prolotherapy: Above the Diaphragm
in Biddeford, ME

June 27-29
Manual Medicine/Manipulation for Physicians: Upper Back, Neck and Upper Extremities
in Chicago, IL

July 18-20
OMT for Common Organic and Clinical Problems
in East Lansing, MI

August 21-24
13th Annual OMT Update "Application of Osteopathic Concepts in Clinical Medicine plus Preparation for Certifying boards"
at Walt Disney World in Buena Vista, **FL**

September 19-21
Unlocking the Cranial Sutures I: Development and Release
in San Francisco, CA

October 11
One-Day Pre-AOA Convention Workshop: OMT in Geriatrics
in New Orleans, LA

October 12-16
AAO Program at AOA Convention
in New Orleans, LA

November 7-9
Prolotherapy: Below the Diaphragm
in Biddeford, ME

December 5-7
Visceral Manipulation: Urogenital
in Fort Lauderdale, FL

Dig On

Anthony G. Chila, DO, FAAO

ECOP

The Educational Council on Osteopathic Principles (ECOP) held its most recent meeting at Pikeville College School of Osteopathic Medicine (PCSOM) from September 12-14, 2002. This group consists of Department Chairs/ Section Heads of OPP of the Colleges of Osteopathic Medicine in the United States, and 16 of the 20 colleges were represented. Established in 1969, ECOP has accountability to the American Association of Colleges of Osteopathic Medicine (AACOM) through that organization's Council of Deans. Cathleen Kearns was present as AACOM liaison to ECOP.

In the normal course of business for ECOP, issues of curriculum teaching are paramount. Over the years, this group has produced the Glossary of Osteopathic Terminology, Core Curriculum in OPP, and Clinical Osteopathically Integrated Learning Scenarios (COILS). Currently, at the request of the AACOM Council of Deans, work is progressing on Clinical and Research Competencies in OPP at the predoctoral and postdoctoral levels.

The highlight of the Fall 2002 ECOP meeting occurred when PCSOM's Edward G. Stiles, DO, FAAO, Professor and Chair of OPP, introduced to the group Robert C. Davis, PhD, Associate Professor, Division of Humanities. During the past several years, these gentlemen have shared time, on a weekly basis, engaging an attempt to better understand Andrew Taylor Still's original osteopathic vision. In his introduction, Doctor Stiles mentioned that Doctor Davis has expertise in linguistics.

The body of Doctor Davis' presentation concerned itself with linguistic analysis of Still's writings, as discussed with Doctor Stiles. Their effort has been to understand and articulate Still's insights with relevance to the contemporary education and practice of osteopathic medicine. In working toward this goal, Doctor Davis discussed three types of conceptual language believed to have given rise to Still's discovery of osteopathic principles. **The language of classical Newtonian mechanics**. This vision of a static universe brought into being by a divine creator was tenable because the mind of God held within itself all elements necessary to make such a universe a reality. The writings of Still offer a similar conception of the human body. We are all familiar with his assertion that the body is the greatest of all God's creations and contains within itself all requisites for health when obstructions have been removed. **The language of the Industrial Revolution.** Still's industrial metaphor was that of the mechanic able to understand and appreciate the principles utilized by the builder in order to successfully remove any obstruction to fluid flow. **The language of 19th century Protestant evangelicalism.** The reference here is to Still's coupling of his perception of the perfection of the human body with his acknowledgment that "The God I worship demonstrates all His work". Doctor Davis noted that the use of metaphors which hindered Still's ability to prove scientific validity of his work in the 19th and 20th centuries has given way in the 21st century to the use of metaphorical language as a form of scientific explanation.

In closing his presentation, Doctor Davis shared with the group his battle with his diagnosis of advanced lymphoma. He described his daily drive to the monastery where he is a member for prayer and breakfast, followed by his teaching and working with students and other responsibilities. Having chosen to forego chemotherapy, he has asked Doctor Stiles to work with him to assist his body's immune system in fighting this cancer. Whatever the eventual outcome, he told the group that this choice has made all the difference in his being able to live joyfully each and every day that he has been given. He considers this to be nothing short of a medical miracle. Nerve, courage and the humility that makes man acknowledge the demands of duty were demonstrated in this discussion. Thank you, Doctor Davis; and Godspeed.❐

Diagnosis and Treatment of Low Back Pain and Introduction to Prolotherapy

Santa Rosa, California
February 6-9, 2003

John C. Glover, DO, Program Chair

The program anticipates being approved for 22 hours of AOA Category 1-A CME credit pending approval by the AOA CCME.

Course Description: Level II

The course will focus on the mechanical causes of low back pain. Differential diagnosis will be discussed and several different models of evaluation will be presented. The physiological basis, indications and contraindications, evaluation, and treatment utilizing different manipulative models will be presented. The participants will be introduced to the concept of ligament laxity and tendon instability and treatment with prolotherapy.

Learning Objectives:

At the end of each session, participants should:

- Differentiate the different causes of low back pain (mechanical, nerve root & disk, spinal & systemic pathology)
- Choose the appropriate manipulative model for the patient and the problem on the basis of indications and contraindications.
- Differentiate the different manipulative models on the basis of physiological mechanisms
- Understand the physiological basis, mechanisms of action, and indications/contraindications of prolotherapy
- Utilize a palpatory screen to evaluate ligamentous laxity
- Utilize a postural/structural model of evaluation to determine the use of osteopathic manipulative treatment
- Practice treatment of findings using multiple models (balanced ligamentous tension, counterstrain, facilitated positional release, Still technique, etc.)
- Observe/practice selected injection techniques used for treatment of low back pain of ligamentous origin
- Evaluate the lumbar spine, pelvis and lower extremity for sources of low back pain
- Understand the role of the viscera in low back pain
- Discuss issues relating to coding and billing

Course Location and Hotel Information:

Hilton Hotel, Sonoma County
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Reservation Telephone: 707/523-7555
Room Rate: $109.00
Reservation Cut-off Date: January 7, 2003

Program Time Table:

Thursday, February 6 ..... 5:00 pm – 10:00 pm
Friday, February 7 ..... 7:00 am – 1:30 pm
Saturday, February 8 ..... 7:00 am – 1:30 pm
Sunday, February 9 ..... 7:00 am – 1:30 pm
(each day includes (2) 15 minute breaks)

Afternoons are open to experience wine-tasting at local vineyards

Registration Form

Diagnosis and Treatment of Low Back Pain & Intro to Prolotherapy

February 6-9, 2003

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From the Archives

Vindication

"The Art of the Bone-Setter", Chapter VII, pages 104-115

George Matthews Bennett

"Is this then your wonder?
Nay, then, you shall understand more of my skill." – Ben Jonson.

LEST it should be thought that I have only my own authority for calling in question Dr. Howard Marsh's dogmatic assertions with respect to the method of practice by modern Bone-setters I find at the same medical jubilee, Mr. R. Dacre Fox, Fellow of the Royal College of Surgeons, of Edinburgh, the surgeon to the Southern Hospital, Manchester; surgeon to the Manchester police force, and whose other practice and official appointments entitle his opinion to some weight, gave his practical experience of the Bone-setter's art, so entirely different and so much nearer the truth, that I shall content myself with merely quoting, whilst thanking him, for his remarks which appeared in the Lancet, for 1882 (vol. ii. pp. 844.) Speaking from three year's experience with the late Mr. Taylor, a celebrated bone-setter at Whitworth. Lancashire, whose family have been bone-setters for more than two hundred years, he told the medical men in plain terms that. Much misconception exists as to the practice of Bone-setters; many of the methods of treatment popularly attributed to them have no other existence than in the imagination of ignorant patients, whose stories we, as a profession, are perhaps rather too ready to believe. It is certain that sonic families-notably the Taylors, Huttons, and Masons-have by their manipulative and mechanical skill justly acquired a great reputation. In what has their practice consisted? First, in the treatment of fractures and correction of deformities. The general impression in the profession appears to be that the Bone-setter's art consists of nothing more or less than the forcible " breaking up" of stiff joints, so as to make the same man walk as if by a miracle. The practice at Whitworth was a large one, furnishing constant employment for at least two active men, and consisting chiefly of the cases I have mentioned. Speaking from memory, I do not believe that fifty joints of all sorts were "cracked up" during the time I was there; but it was not an uncommon event to have to put up half a dozen fresh fractures and twice as many recent sprains in a single morning. In the North of England, the origin of nearly all the men who are fairly good at Bone-setting can be traced to the Whitworth surgery, and while, so far as I know, the Taylors, in their various settlements at Whitworth, Todmorden, Stockwood, and Oldfield-lane, were the only qualified surgeons who practised Bone-setting; amongst the bills and dales of Lancashire, Yorkshire, and the Lake district, there were many who did so without being qualified, some of whom, I must in fairness say, put up fractures uncommonly well. But apart from the legitimate credit they have won by the skill displayed in their handicraft, they owe some of their success to the carelessness or indifference of the general body of practitioners, who are apt to overlook little injuries, which often become very painful and troublesome. It sometimes seems to me that it is beneath the dignity of the ordinary practitioner to employ any active treatment whatever for a sprain. It is hardly fair then to gauge the work of Bone-setters; solely by their method of treating diseased joints (probably the most unsatisfactory class of cases in the whole realm of surgery), but we ought also to take into account the patience and skill they display in the treatment of injuries for which they are not infrequently consulted by the patients of qualified practitioners. I have no desire to hold a brief for every idle fellow who calls himself a Bone-setter, but I am anxious to give credit - where credit is due, and to explain that the art of Bone-setting is not what it is often thought to be a mere mixture of charlatanism and good luck.

From my own experience, I should classify weak joints as follows:

1. Those that have become stiff from enforced rest.

2. Those that have become stiff by chronic disease.

3. Joints stiff from injury to the

bones entering into their formation.

4. Joints stiff and weak from sprains, including displacement of tendons and partial luxation.

Apart from the previous history of the case, and the evident existence of constitutional disease, there are some external appearances which help to distinguish cases and to afford indications of treatment, and of these the Bone-sette-rs have learned by experience to avail themselves.

1. In the first-class I have mentioned the stiffness of the structures about the joint impeding its movement is the result of purely mechanical causes, is in fact simply due to prolonged disuse. No cause for functional activity exists, and consequently the elasticity, the flexibility and power of adaptation to movement in the parts about the joints not being required they become stiff and rigid. No degenerative changes however taking place, and they are capable of being recalled into activity unimpaired. In such a joint, the bony points, and the outlines of the tendons and ligaments about it, seem unnaturally prominent, probably from absorption of the adipose and connective tissue; the rigid ligaments impart a sense of hardness, and if the limb be flexed to its utmost, it shows considerable resiliency, such joints may, I believe, be "cracked up" without fear of consequences, and this constitutes one of the successful operations of Bone-setters. My own recollection carries me back to some apparently almost miraculous results. I am convinced suddenness ought to be insisted on in doing this; the advantage derived from it being, I believe, mainly due to the fact, that it is less likely to set up any irritation in the joint than the "dragging" of gradual extension.

2. In the next class of cases, in which stiffness is due to degenerative changes, the external appearances are exactly reversed; the outlines of the joint are more or less gone. In these cases, no matter the character of the disease, manipulative interference is positively vicious; and while it is in them that ignorant Bone-setters do so much mischief, the better informed, by the use of splints and well applied pressure, are highly successful in their treatment. I am sorry to say, many cases of this kind come to Bone-setters which have not been properly treated before, owing to their not having been recognised, especially hip-joint disease.

3. On the third-class of cases, in which a fracture has taken place into the joint, causing stiffness, the condition is due to disturbed relationship of the bones from faulty setting, and is recognised by comparison with the bony landmarks of the sound limb. In these cases forcible treatment does good; though, of course, the result is in proportion to the amount or bone-displacement, but it should be supplemented by passive movements for some time. In joints stiff after diagonal fracture through the condyles of the humerus so common in children, I have seen many most gratifying results; one in a boy about twelve years old, whose elbow bad been stiff three years is especially impressed on my mind.

4. In the fourth-class of cases, and those to which I would draw particular attention, I include lameness and weakness, the result of the various forms of injury, which we group together under the general term a "sprain". I affirm most unhesitatingly, from an experience of some hundreds of cases, that nothing has done more to lower the prestige of regular practitioners, and to play into the hands of unqualified Bone-setters, than the way in which so many practitioners tamper with a sprained joint. Sprains, of course, vary greatly in severity; they way be broadly divided into two kinds, of which one consists merely of a temporary over distention of the parts round a joint which rest, and anodyne applications soon cure, while the other involves pathological results a much more serious nature. A severe sprain is the sum of the injuries that the parts in and about a joint sustain, when, by their passive efforts, they exercise their maximum power of restraint to prevent luxation. Under such conditions, I conceive the following changes to take place in the integrity of a joint. In the case of the synovial membrane, temporary hyperemia accompanied by pain, and some slight effusion into the cavity of the joint.

In the case of the tendons, over-stretching and loosening of the lining membrane of their sheaths, more or less disturbance to the adjacent cellular tissue forming the bed of the tendon groove, and hyperemia with exudation of plastic fluid, subsequently forming adventitious products. In the case of the non-elastic fibrous ligaments – firmly attached at either end to the adjacent periosteum – over-stretching, mostly involving partial rupture, with swelling, softening, and disintegration of their structure. It is beyond the purpose of this communication to draw attention to the plan of treatment adopted by Bone-setters under these circumstances; it is, however, described in a paper of mine, of which an abstract is given in the *British Medical Journal*, of September 25, 1880. The stiffness of a sprained joint is partial. The surface is generally cold, or more or less oematous, and each joint has one particular spot in which pressure causes acute pain; the Bone-setters have learned by experience the situation of these spots, and this fact has done more than anything to strengthen the popular faith in their intuitive skill; they certainly form an important guide to treatment since they indicate the seat of greatest injury to the ligaments, and point out where their power of passive resistance has been most severely tested, and where adhesions are most likely to have formed, Dr. Hood, in his record of Mr. Hutton's practice, has enumerated some of these painful spots, the chief of them are as follows:

1. Over the head of the femur in the centre of the groin, correspond-

ing to the ilio-femoral band of the capsular ligament (which is most severely stretched when the thigh is over extended, as when the trunk is flung violently backwards the commonest cause of a sprained hip).

2. For the knee joint, at the back of the lower edge of the internal condyle, in other words, at the posterior border of the internal lateral ligament where it blends with Winslow's ligament, and where the senior membranous tendon is in intimate relation with it. These parts suffer most because as Mr. Morris says: 'During extension they resist rotation outwards of the tibia upon a vertical axis' and a sprained knee is almost always caused by a twist outwards of the foot.

3. For the shoulder at the point corresponding to the bicipital groove, because in nine cases out of ten a man sprains his shoulder to prevent himself from falling, his hand grasps the nearest support, the body is violently abducted from the arm, the long head of the biceps is called upon to exert its utmost restraining power, the bicipital fascia is overstretched, and the tendon very often displaced.

Again for the elbow, the painful place is at the front of the tip of the internal condyle; the fan-shaped internal lateral ligament has its apex at that point, and it is most stretched in over-supination, with extreme extension of the forearm. On the front of the external malleolus, at the apex of the plantar arch, the tip of the fifth metatarsal bone, the styloid process of the ulna, the inside of the thumb, and the annular ligament in the front of the wrist, are respectively the most painful spots when those joints are severally sprained.

The manipulative part of the treatment of joints stiff from being sprained may be briefly said to consist in pressure over the part most injured, and momentary extension of the limb, followed by sudden forcible flexion. The method varies with each joint, and I can with confidence refer you to Dr. Wharton Hood as being faithful word-pictures, supplemented, too, by very accurate drawings.

The following are some of the lesser injuries, the non-recognition of which has frequently come under my notice at Whitworth. In the upper limb: fracture of the tip of the acromion; practical luxation of the acromio-clavicular and sterno-clavicular joints (often happening to men who carry weights on their shoulders); partial dislocation of the long head of the biceps, with over extension of the bicipital fascia (common in men who throw weights or use a shovel as malsters or navvies). Dislocation of the head of the radius forward on the condyle, which is very common in children, and has a marked tendency to cause stiff elbows; fracture of the tip of the internal condyle; overlooked Colles' fracture; partial luxation of the head of the ulna (impeding supination of the hand, and having a tendency to gradually grow worse); severe sprain at the carpo-metacarpal joint of the thumb (very common in stone masons and caused by the 'jar' of heavy chisels).

In the lower limb: Fracture of the fibula, just above the malleolus and at its tip (these are fruitful sources of lameness, often overlooked, and, if of old standing, very troublesome to treat); partial rupture of the ligamentum patellae at its insertion into the tubercle of the tibia, which is much more common than is ordinarily supposed; neglected over-stretching of the ligament of the plantar arch, and tearing of the plantar ligament at its insertion into the os-calcis; rupture of the penniform muscular attachments of the tendo Achilles and muscular hernia in the calf.

I trust I shall be forgiven if I have dwelt too much on the étourderie of some of us, but I am sure so-called trifling injuries deserve more attention at our hands, since living at the high pressure men do now-a-days, with every part of their bodies tested to its utmost capacity, the slightest impairment of the mechanism of a limb must be an incalculable source of personal annoyance, discomfort, or disability."

"When doctors disagree who shall decide?" The readers of this little manual will probably say as they read Mr. Dacre Fox's paper, that it is alike a testimony and a vindication of the "Art of the Bone-setter." ❐

Understanding the Combined Motions of the C3/C4 Vertebral Unit: A Further Look at Fryette's Model of Cervical Biomechanics

John D. Capobianco, DO, FAAO, Marina G. Protopapas, DO, and Sonia Rivera-Martinez, DO

Abstract

The osteopathic concept of spinal motion is predicated on the observations of Harrison H. Fryette, DO. According to his theory of spinal motion, rotation and sidebending at the segmental level in the cervical spine are coupled. The typical cervical segment demonstrates rotation and sidebending to the same side. The null hypothesis is that rotation and sidebending of a typical cervical vertebral unit will be to the same side on passive intervertebral motion testing, as demonstrated by Fryette's laws of spinal motion. The objective of this research is to experimentally test the validity of Dr. Fryette's hypothesis of coupled motion in a typical cervical vertebral unit. Specifically, motion of the third cervical vertebral unit; that is the third cervical vertebra in relation to the fourth cervical vertebra was tested. The data collected was statistically analyzed in order to determine whether rotation and sidebending at the segmental level in the cervical spine move to the same or opposite directions. Board certified osteopathic physicians were the examiners and 289 asymptomatic adult volunteers were the subjects. For the purposes of this study coupled motion is defined as rotational and sidebending motion in the same direction while uncoupled motion occurs in opposite directions. The results of experiments 1 and 2 suggest a greater frequency of uncoupled versus coupled motion at the C3 on C4 vertebral unit. Coupling occurred at a lesser frequency than would have been predicted by Fryette's laws of spinal motion. A third experiment was conducted to test if repeated passive motion testing affected the outcome of interexaminer reliability in experiment 2. Conclusions, which may be drawn from this research, are that cervical vertebral motion does not concur with Fryette's theory of coupled motion and passive motion testing may affect interexaminer reliability.

Introduction

The osteopathic concept of spinal motion is predicated on the observations of Harrison H. Fryette, DO. Dr. Fryette[1] began his work on spinal motion in 1903 with a spine mounted on soft rubber. This served as an even better model than the living spine for the purpose of teaching. Fryette asserted that a single vertebral unit (involving one vertebra upon another, i.e. the third cervical upon the fourth cervical vertebra) follows rotation into the concavity, that is rotation and sidebending are coupled with motion in the same direction. He did not distinguish between sagittal plane motion (flexion and extension) and neutral in the cervical spine as in the thoracic and lumbar regions. Fryette's theories of spinal biomechanics did not occur in a vacuum, and evolved from the contributions made by Lovett[2] and Halladay.[3] Fryette and those who influenced him were unclear regarding segmental or group motion of the cervical spine. The biomechanics of the cervical spine may be due to this region's decreased lordosis[4] or lesser sagittal curvature when compared to the thoracic and lumbar spine. Historically, the osteopathic profession has adopted Fryette's model of the law's of cervical spinal motion into the standard osteopathic literature and curricula.[5,6,7,8,9] Kapandji's[10] model of cervical motion, based on an oblique axis through the posterior aspect of the body of the vertebrae, perpendicular to articular facets, also states that rotation and lateral flexion (sidebending) are indeed coupled, occurring to the same side. This paper will further define coupling or coupled motion of the cervical spine as rotation and sidebending in the

➔

same direction for the standardization of nomenclature (Table 1). Uncoupling or uncoupled motion represents rotation and sidebending in the opposite direction. Kapandji[10] states that according to his own model, the geometrical analysis of the components of rotation and sidebending in the cervical spine would be complex enough to require computer-calculated values. In this study, palpation on living subjects by passive motion testing was used to determine the motion patterns in the cervical spine.

Literature Review

Motion studies of the thoracic and lumbar spines seem to contradict the conventional pattern of ipsilateral rotation and lateral flexion (sidebending) described by Fryette's theory of spinal biomechanics. Willems, et al,[11] studied the motion characteristics of primary and secondary rotations in the thoracic spine of sixty asymptomatic subjects. Their study illustrates the complexity of motion in the thoracic spine. One of the observations made was that combined motion of lateral flexion and axial rotation in the *upper* thoracic spine occurs with equal frequency in both an ipsilateral and contralateral direction, when lateral flexion was the primary movement. In addition, it demonstrated that when the primary movement was axial rotation, the combined motion with lateral flexion was predominantly contralateral. For the *middle* and *lower* thoracic spine the combined motion of rotation and lateral flexion were found to be mainly ipsilateral. In addition, it was demonstrated that individual subjects of the group tested had different motion patterns within their own thoracic spine. For example, during a subject's testing for lateral flexion to the right, there was an accompanying ipsilateral (right) axial rotation. However, further testing of that same subject for lateral flexion to the left resulted in an associated axial rotation to the right. This side-to-side discrepancy occurred mostly when lateral flexion was the primary motion.

The complexities of spinal motion also include those demonstrated by the lumbar spine. Percy and Tibrewal[12] used a three-dimensional radiographic model to identify regional differences of inter-segmental patterns of motion in the lumbar spine. The subjects were divided into two groups: one group was studied for axial rotation as primary motion, and the second group for lateral flexion as its primary motion. The upper levels of the lumbar spine exhibited lateral flexion and rotation in the opposite direction. Furthermore, motion at the L4-L5 level revealed that lateral flexion and rotation could occur either in the same direction or in opposite directions. Combined lateral flexion and rotation for L5-S1 was demonstrated to occur to the same side.

In contrast to the thoracic and lumbar spine, studies on the cervical spine seem to be in agreement with Fryette's laws. The combined motion of lateral flexion and rotation of the cervical spine have been described by Lysell[13] in his three-dimensional radiographic study of 28 fresh cadaveric specimens. Lysell calculated the ratio of combined motion for all segments below C1. His study found the lowest ratio for lateral flexion/rotation and rotation/lateral flexion at C2 and a gradual increment in the ratios down the cervical spine. This indicates that at C2 there is the largest combined lateral flexion and rotation, with the motion becoming smaller at the more caudal segments. Furthermore, this study found that both lateral flexion with rotation and rotation with lateral flexion occurred ipsilaterally in the neutral, flexion an extension positions. The Mimura, et al[14] three-dimensional motion study of twenty normal men supports Lysell's findings on the combined motion of lateral flexion with associated rotation for levels including and below C3-C4. However, at the level of C2-C3 and above, Mimura's study found rotation and lateral flexion occurring in opposite directions. In addition, they found that flexion occurred concomitantly with rotation and lateral flexion below C5-C6. Moreover, extension accompanied rotation with lateral flexion above the C4-C5 level. Therefore, in contrast to Lysell's in-vitro experiment, Mimura found not only the addition of sagittal plane motion in combination with coronal and horizontal movement, but also contralaterality of rotation and sidebending at the second on the third cervical vertebrae.

As explained above, non-osteopathic literature regarding the thoracic and lumbar spinal biomechanics are not in agreement with Fryette's principles. Fryette's conclusions were

Osteopathic Definitions
Table 1

Vocabulary Word	*Definition*
Somatic Dysfunction (SD)	Impaired or altered function of related components of the somatic system: skeletal, arthroidal, and myofascial, and related vascular, lymphatic and neural elements (17).
TART	Also ART, mnemonic for tissue texture abnormality, asymmetry, restriction of motion and tenderness. Tenderness is subjective and therefore will not be included for criteria of SD (17).
Vertebral Unit	Two adjacent vertebrae with their associated intervertebral disc, arthroidal, ligamentous, muscular, vascular, lymphatic and neural elements (17).
Vertebral Rotation (R)	Movement about the anatomical vertical axis of a vertebrae; named by the motion of a midpoint on the anterior superior surface of the vertebral body (17).
Sidebending (SB)	Movement in a coronal (frontal) plane about and anterior-posterior axis; also called lateral flexion, lateroflexion or flexion right (or left) (17).

made on a non-living spine. This would exclude the influence of soft tissue elements on cervical biomechanics. Both Mimura's and Lysell's studies disclose the multifarious motions of the cervical spine and bring to question Fryette's laws for this spinal region.

The purpose of this study is to scientifically demonstrate the palpatory findings that have been observed during patient diagnosis. This study will provide a venue for evidence based osteopathic medicine, in that uncoupled intersegmental motion of the cervical spine is a clinical and academic possibility. Ultimately, this may have clinical applications.

Methods

Three major experiments comprised this research project. The purpose of the first two experiments was to test the hypothesis that rotation and sidebending of a typical cervical vertebral unit could occur in opposite directions on passive intervertebral motion testing. Further, our experiments would disprove the null hypothesis of rotation and sidebending occurring in the same direction according to Fryette's laws of spinal motion. A third experiment was done to analyze if passive motion testing affected the outcome of interexaminer reliability as inferred in the second experiment. These experiments were held one year apart, using three different subject populations and different combinations of the original group of examining physician's who participated in Experiment 1.

The criteria used to screen subjects that participated in this research were the same for all three experiments. All volunteers were adults and were interviewed prior to each experiment to determine their suitability. Specific exclusion/inclusion criteria were set for these experiments. There was no age range specified in either experiment. Individuals were excluded if they had suffered trauma to the cervical spine two months prior to the experiment, or had any other medical or surgical condition that could alter their participation in the experiment. The subjects who were allowed to participate in this project were all healthy and without any relevant symptoms to the cervical region. Subjects who met all exclusion/inclusion criteria were asked to voluntarily participate and to sign an informed consent. The protocol that was used in these experiments was approved by NYCOM's human studies review board and met all regulatory requirements and appropriate ethical standards. There were no risks inherent to this experiment as this only involved diagnostic palpation to an exposed neck. The benefits of this study were to provide a fuller understanding of diagnostic interpretation for the osteopathic physician, and to provide a rationale for osteopathic treatment.

The osteopathic physicians who participated in these experiments met the following criteria: they were either Fellows of the American Academy of Osteopathy and/or Board Certified in Special Proficiency according to the American Osteopathic Board. One physician, who was board certified in the osteopathic board of rehabilitation medicine, was board eligible for the osteopathic manipulative medicine (OMM) certification and subsequently attained that board certification in OMM. The physicians who were selected all had experience teaching diagnostic palpation at various U.S. osteopathic institutions during their careers. The inclusion criteria for the physicians conducting this experiment were of high standard in order to ensure that the examiners' diagnostic abilities were at a high level of confidence.

The method for determining cervical diagnosis was also the same for all three experiments. In order to test for sidebending, the physician was situated at the head of the supine subject. While supporting the head of the subject, the physician palpated the lateral borders of the articular pillars of C3. The force was localized to the C3 segment, and lateral translation in both the right and left directions about the coronal plane.[15] For example, when segmental response to lateral translations was compared right with left, finger contacts were placed on the articular pillars to monitor the response at C3. If there was resistance during translation to the right and less resistance noted in translation to the left this finding was reported as sidebending to the right.[16] In order to test for rotation, the physician was required to move the C3 articular pillars anteriorly on the right and left about the horizontal plane. This induced rotation. Resistance to anterior movement of the right articular pillar with more motion noted in anterior movement on the left was reported as right rotation. There were only three types of findings that could be palpated during diagnosis: left, right and none. The combinations of each direction to each parameter (rotation and sidebending) qualified it as being uncoupled (SB and R opposite), coupled (SB and R same side), NC/NU [non-coupling/non-uncoupling] (either SB or R were not present) and no finding/no motion preference (neither SB nor R). The examiner only diagnosed one variable (SB or R) in order to eliminate bias due to preconceived knowledge based on Fryette's theories and laws of spinal mechanics.

It should also be mentioned that the observers conducting the palpatory testing were blinded to each other's findings. Physicians were required to submit their findings immediately after it was made on each subject, regardless of the number of times the subject rotated through their section. Volunteer assistants immediately documented the diagnoses and no communication was permitted between the examiners and/or subjects regarding the findings, further

eliminating bias in our experiment.

Although the approach to diagnosis was the same in all three experiments, there were additional variables and controls added to each subsequent experiment. The experiments were set up so as to provide as much of an unbiased set of findings as possible.

Experiment 1

One hundred and seventy two subjects and eight osteopathic physicians were recruited for this experiment. A computer lottery system was used to distribute the subjects randomly to three different examiners. This prevented each subject from being diagnosed by the same physician for more than one diagnostic component. The subjects were examined in the supine position with the cervical spine in the *neutral* position. Each individual was sent to one physician who was randomly directed to segmentally motion test the C3 vertebral segment for rotation or sidebending or to palpate for the presence or absence of somatic dysfunction. The three major parameters tested for in this experiment included rotation, sidebending and somatic dysfunction (SD). Each subject was examined once for sidebending, once for rotation and once for the presence/absence of SD.

At least two out of the four criteria for somatic dysfunction (i.e. Asymmetry [A], Restriction of motion [R] and Tissue texture changes [T]) was necessary to elicit a finding of somatic dysfunction (Table 1). The criteria for "tenderness" was not elicited in order to avoid subjectivity on behalf of the examiner. In order to determine the presence of somatic dysfunction, palpation of the C3 vertebral unit was utilized to reveal tissue texture changes [T] (i.e. bogginess, ropiness of underlying soft tissues), greater prominence of the articular process on either side with respect to the other, suggesting positional asymmetry [A]; and restricted motion [R] in the coronal and horizontal planes as noted previously in motion testing.[17]

Experiment 1: Permutation of Diagnoses on C3/C4
Table 2

Plane	*Sidebending*	*Rotation*	*Som. Dysfunction*
Neutral	Right	Right	Y or N
	Left	Left	Y or N
	Right	Left	Y or N
	Left	Right	Y or N
	None	Right	Y or N
	None	Left	Y or N
	Right	None	Y or N
	Left	None	Y or N
	None	None	Y or N

Experiment 2: Permutation of Diagnoses on C3/C4
Table 3

Plane	*Sidebending*	*Rotation*
Flexion	Right	Right
	Left	Left
	Right	Left
	Left	Right
	None	Right
	None	Left
	Right	None
	Left	None
	None	None
Extension	Right	Right
	Left	Left
	Right	Left
	Left	Right
	None	Right
	None	Left
	Right	None
	Left	None
	None	None
Neutral	Right	Right
	Left	Left
	Right	Left
	Left	Right
	None	Right
	None	Left
	Right	None
	Left	None
	None	None

Experiment 2

Ninety-seven subjects and five osteopathic physicians (who were also a part of Experiment 1) volunteered to take part in Experiment 2. This study was different from the first experiment in that the dimensions of rotation and sidebending were tested not only in the neutral position but also by motion testing along the sagittal plane. According to Gibbons,[18] vertebral motion may be described using standard anatomical cardinal planes and axes of the body. Spinal motion is described as rotation around, and translation along, an axis as the vertebral body moves along one of the cardinal planes. The vertical axis is labeled as the y-axis; the horizontal axis is labeled as the x-axis; and the anterior-posterior axis is the z-axis. He defines the sagittal plane

as being in the yz plane; the coronal as the xy plane; and the horizontal as the xz plane (Figure 1).

Gibbons states that in flexion there is an anterior (sagittal) rotation of the superior vertebrae around the x-axis while there is accompanying forward (sagittal) translation of the vertebral process along the z-plane. In extension the opposite occurs and the superior vertebra rotates posteriorly around the x-axis and translates posteriorly along the z-plane. In sidebending there is bone rotation around the anterior-posterior z-axis but sidebending is rarely a pure movement and is generally accompanied by vertebral rotation. The combination and association, of one movement with others is termed "coupled motion". Our definition of coupling is that it is a bi-planar motion of SB and R occurring to the same side, which is similar to Fryette's second law of spinal motion. Uncoupling, on the other hand, is a bi-planar motion where SB and R are opposite in direction.

Another parameter added to this experiment was interexaminer reliability. Each subject was randomly assigned to five different stations. At each station, a physician was required to determine one variable of the person's diagnosis (as was done in the first experiment). By the end of each experimental cycle, each subject was rotated to a different physician and examined 24 times: 3 Sidebending/Flexion, 3 Rotation/Flexion, 6 Sidebending/Neutral, 6 Rotation/Neutral, 3 Sidebending/Extension, and 3 Rotation/Extension. This was done to test for the consistency of diagnosis among physicians, establish a basis for interexaminer reliability and compare these results to those of the first experiment. The rationale for 6 diagnoses made for each subject in the neutral plane was because this data could be utilized at a later time to determine intraobserver reliability. It was also done as a reproducible form of Experiment 1, which included only palpation in the neutral plane. Also, the presence of somatic dysfunction was not tested for in this experiment because the presence of somatic dysfunction did not affect the outcome of the first experiment (Refer to Graph 1).

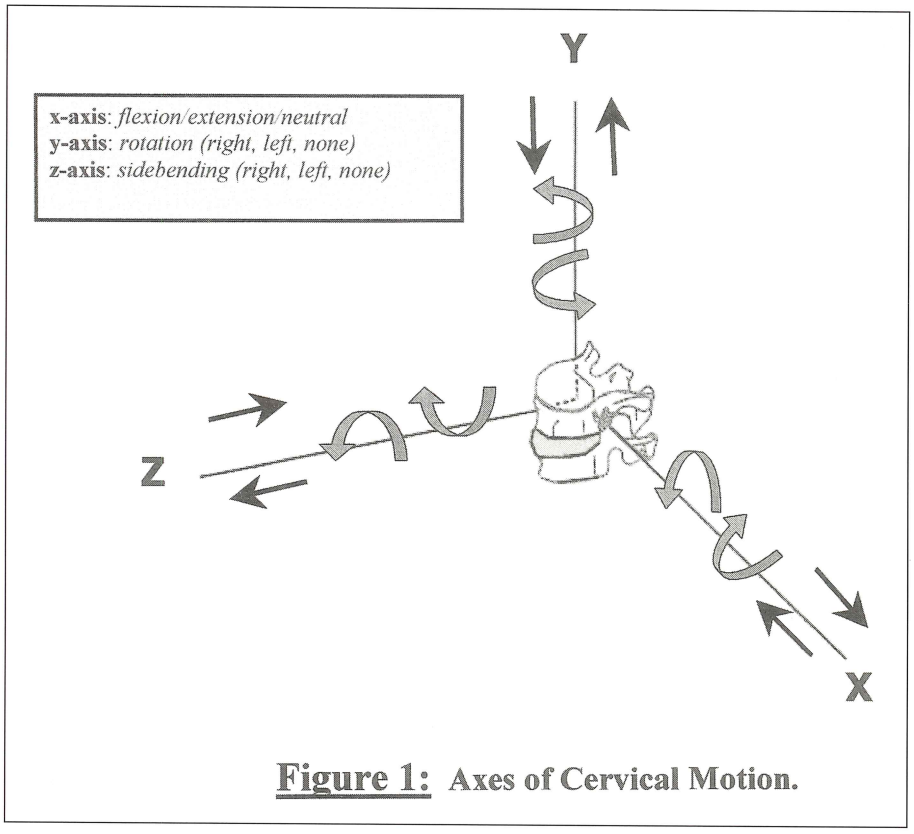


Figure 1: Axes of Cervical Motion.

Experiment 3

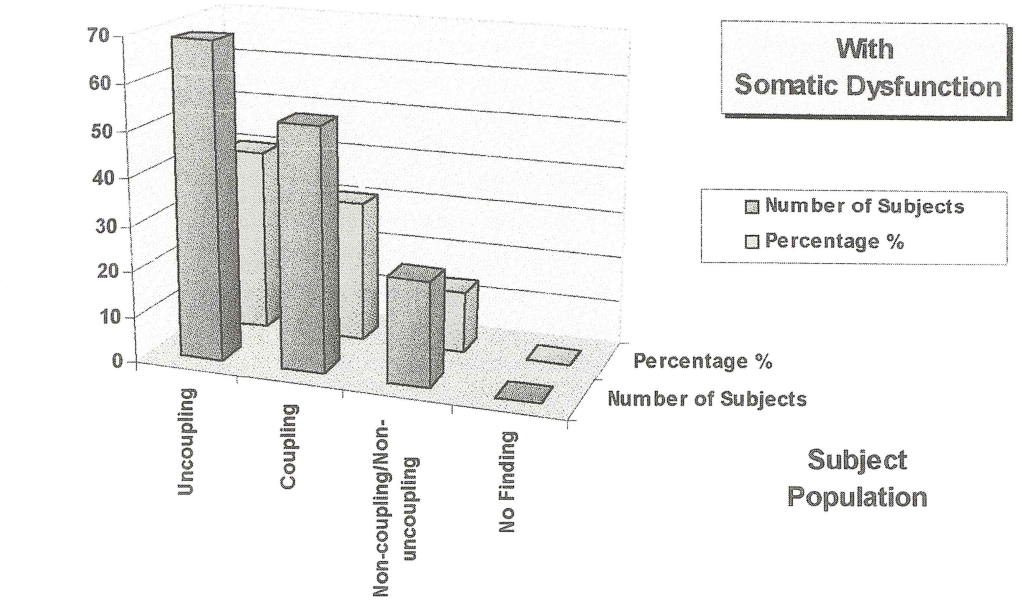
This part of the project was conducted to demonstrate the effect of palpatory diagnosis via passive motion testing in causing an alteration of the finding during subsequent motion testing of the C3/C4 vertebral segment. It was also done to explore the lack of consistency found in interexaminer diagnostic palpations in Experiment 2. The three physicians who took part in Experiment 3 were also participants of Experiment 1 and 2. There were two groups of subjects (20 total) who participated in this pilot study: ambulating and stationary groups. The purpose of adding this factor (ambulating vs. non-ambulating) to the experiment was to determine if walking from one examiner to the next affected the diagnosis at the C3/C4 vertebral level.

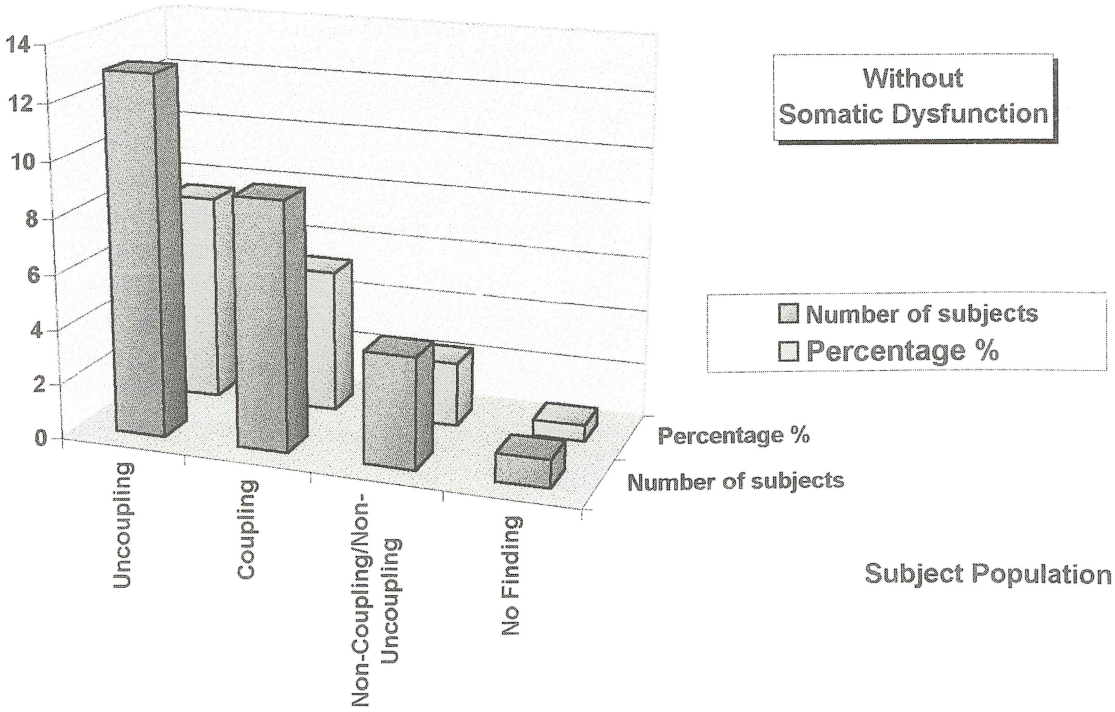
Each subject had the level of C3 vertebra marked for diagnosis to assure consistent palpation of the examined level. Once again, physicians were blinded to the diagnostic findings found by each other. The examiners communicated the findings to a volunteer assistant and the subjects were kept unaware. The setup for each physician was to examine the subjects two or three times each. The vertebral segment would be passively motion tested a total of seven times. The examiner who initially palpated the subject's cervical spine would also be the one to make the final assessment. This was done to compare the first and last diagnosis made by each physician and thus tests for intraobserver reliability.

Data Analysis

The data collected in these experiments were evaluated via statistical

Experiment One
The Relationship Between Somatic Dysfunction and Uncoupling/Coupling/Non-Coupling/Non-Uncoupling/No Finding Diagnosis
Graph 1





analysis in the form of contingency tables. The goal of a contingency table was to compare the experimental data to that of the null hypothesis. In this case, the first two contingency tables will compare actual diagnoses to those predicted by the null hypothesis. For experiment 1, there were nine plausible diagnoses that could have been recorded for the C3 segment (C3/C4 vertebral unit) by the physicians on the day of examination. Table 2 shows the nine possible diagnoses that could be palpated. It also includes whether somatic dysfunction was present at the C3 segment, and if it was more prevalent with a coupled (SB and R to the same side) or an uncoupled (SB and R opposite) diagnosis. In the second experiment there were twenty-four possible findings as depicted in Table 3.

The criteria used to evaluate the data in experiments 1 and 2 involved compiling the majority number of diagnoses for rotation and sidebending in order to categorize the data into uncoupled/coupled/NC-NU/no finding. Nansel et al.[19] stated that it is imperative to have a convincingly high level of interexaminer concordance for the detection of a given palpatory entity to have diagnostic relevance. Interestingly, Nansel did not address static palpation. However, his study did find poor levels of interexaminer agreement for "motion based palpation".

It should be noted that the "no finding" parameter was not included in the statistical analysis because it signifies that no diagnosis was made, and thus would not offer any support towards the hypothesis of this experiment. This experiment was based on having positive findings, or the presence of a diagnosis. Also, the frequency of "no finding" was not significant enough to include in the final statistical analysis.

The mathematical equation that was used to determine the significance of the data collected is the following:

$$X^2 = \sum(\text{observed} - \text{expected})^2 / \text{expected}$$

Agreement Measures For Categorical Data
Table 4

Kappa Statistic	*Strength of Agreement*
<0.00	Poor
0.00-0.20	Slight
0.21-0.40	Fair
0.41-0.60	Moderate
0.61-0.80	Substantial
0.81-1.00	Almost Perfect

Percent Frequency of Diagnoses in the Neutral Plane for Experiment 1
Table 5

Pattern of Sidebending/ Rotation	*Number of Subjects*	*Comparative Percent*
Uncoupled (SB and R Opposite)	82	47.95 %
Coupled (SB and R Same)	62	36.26 %
Non-Coupled /Non-Uncoupled (Either SB or R were not present)	27	15.79 %
Total	171	100 %

This equation provides a means to determine whether or not there exists any relationship between the expected and observed values, as well as, offer a means to prove or disprove the null hypothesis. Before the value of X^2 can be used, the degrees of freedom (df) must be determined.

Df = (no. of rows –1)(no. of columns – 1)

The critical value of X^2 must be greater than that determined by the degrees of freedom in order to determine a significant correlation between the data, as well as, to reject the null hypothesis.

Kappa values were calculated on experiments 2 and 3 using Siegel's formulas for non-parametric statistical analysis.[20] These values were used to determine interexaminer, as well as, intraobserver reliability. Kappa coefficients measure examiner agreement beyond that which is expected by chance alone. The kappa coefficient has a maximum value of 1.0 when there is perfect agreement; a value of zero indicates purely chance agreement; and a negative value is defined as agreement below chance. The guidelines that were used to evaluate the kappa values in this experiment are listed in Table 4.[21]

Results

The three studies that comprised this project were performed using three different subject populations and three different subsets of the original group of examiners. The three different sets of data that were collected from all experiments inferred poor evidence of Fryette's coupled (SB and R same) segmental motion theory of the cervical spine. In the first experiment the findings palpated were diagnosed only in the neutral plane. Table 5 summarizes the frequencies of uncoupling, 47.95%, which was greater than that of coupling, 36.26%, and that of Non-coupling/Non-uncoupling (NC/NU) diagnosis, 15.78%. The significance of

Chi Squared and P Values for Experiments 1 and 2
Table 6

Experiment No.	*Plane*	*Diagnosis*	X^2	*P value*
Experiment One	*Neutral*	Uncoupled	10.96	0.005
		Coupled	0.44	0.950
		Non-Coupled/Non-Uncoupled	15.78	< 0.001
Experiment Two	*Neutral*	Uncoupled	0.61	0.800
		Coupled	0.058	>0.980
		Non-Coupled/Non-Uncoupled	1.04	0.700
	Flexion	Uncoupled	0.61	0.800
		Coupled	0.0146	>0.990
		Non-Coupled/Non-Uncoupled	0.439	0.950
	Extension	Uncoupled	0.635	0.800
		Coupled	1.08	0.700
		Non-Coupled/Non-Uncoupled	0.0605	>0.980

Percent Frequency of Diagnoses in Experiment 2 Including Flexion, Extension and Neutral Planes
Table 7

Sagittal Plane	*Diagnosis*	*No. of Subjects*			*Percentage*		
Neutral	Uncoupled	35			38.04 %		
	Coupled	32			34.78 %		
	Non-Coupled /Non-Uncoupled	25			27.18 %		
Flexion	Uncoupled	35			38.04 %		
	Coupled	30			32.61 %		
	Non-Coupled /Non-Uncoupled	27			29.35 %		
Extension	Uncoupled	34			38.20 %		
	Coupled	24			26.97 %		
	Non-Coupled /Non-Uncoupled	31			34.83 %		
Totals		Neutral	Flexion	Extension	Neutral	Flexion	Extension
		92	92	89	100%	100%	100%

Evidence of Reproducibility:
Comparative Frequency of Sidebending/Rotation Experiments 1 and 2 in the Neutral Plane
Table 8

Diagnosis	*Experiment 1*	*Experiment 2*
Uncoupled (SB and R Opposite)	47.95 %	38.04 %
Coupled (SB and R Same Side)	36.26 %	34.78 %
Non-Coupled /Non-Uncoupled (Either SB or R not present)	15.79 %	27.18 %
Total	100 %	100 %

these values indicates that Fryette's postulate of coupled motion in a typical cervical vertebra must be questioned. The x^2 values and p values as illustrated in Table 6 are significant for uncoupling ($p > 0.005$), and non-coupling/non-uncoupling ($p < 0.001$) and insignificant for coupling ($p = 0.95$). Since the statistical occurrence for these three diagnoses is presumed to be equal, it appears that uncoupling occurs more frequently and is more statistically significant than an NC/NU and coupled finding. The data analyzed in this experiment suggests that uncoupled and NC/NU findings are likely to occur with 99% certainty, thus failing to accept the null hypothesis, giving credence to the experimental hypothesis instead. Coupling occurs at a rate, which the null hypothesis fails to predict, occurring approximately one-third of the time. This further lends support to our hypothesis that rotation and sidebending occurs in opposite directions at the segmental level in a typical cervical vertebral segment. Chi-square and p values were also calculated for the appearance of somatic dysfunction (SD) in conjunction with uncoupling/coupling/NC-NU and were non-significant. As demonstrated by Graph 1, the presence of SD is independent of diagnosis. This demonstrates that coupling and uncoupling occurred regardless of the presence or absence of somatic dysfunction versus non-somatic dysfunction. A SD is not more prevalent in uncoupling/coupling/NC-NU.

Table 7 displays the percent distribution of diagnosis in Experiment 2 for the neutral, flexion and extension planes. In particular, 38.04% of the diagnoses made were for uncoupling (SB and R opposite), 34.78% for coupling (SB and R same) and 27.18% for NC/NU in the neutral plane. Table 8 summarizes the comparative frequency of each diagnosis between experiments 1 and 2 in the

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Experiment 3: Summary of Kappa Values Calculated for Inter-Examiner Reliability on Diagnosis Includes (stationary and ambulating)
Table 9

Diagnosis	*Kappa Value*
1 and 2	0.486081
1 thru 3	0.373219
1 thru 4	0.303212
1 thru 5	0.266810
1 thru 6	0.222475
1 thru 7	0.116458

Experiment 3: Summary of Kappa for Intra-Observers
Table 10

Examiner	*Kappa Value*
Dr. X	0.02174
Dr. Y	0.05983
Dr. Z	0.07407
All observers	0.06542

form of percentages. Table 6, records the x^2 values and p values for uncoupling ($p=0.80$), coupling ($p>0.98$) and NC/NU ($p=0.70$). All the p values obtained, therefore, suggest that each diagnosis occurred at random and at an equal rate of about a third of the time. There are as many uncoupled diagnoses as expected, but there are also fewer coupled diagnoses than expected. Coupling was found to occur at a lower frequency than uncoupling, with the NC/NU diagnosis having the lowest frequency and coupling the least significance.

Table 6 also demonstrates that in the flexion plane of Experiment 2, the p values were not significant for coupling, uncoupling or NC/NU findings. Uncoupling ($p=0.80$), coupling ($p>0.99$) and NC/NU ($p>0.95$). Uncoupling occurred at the expected rate, with coupling and NC/NU found to occur at a lesser rate than uncoupling. However, coupling (SB and R same) and the NC/NU diagnoses have the same lack of statistical significance, which was less than that of uncoupling.

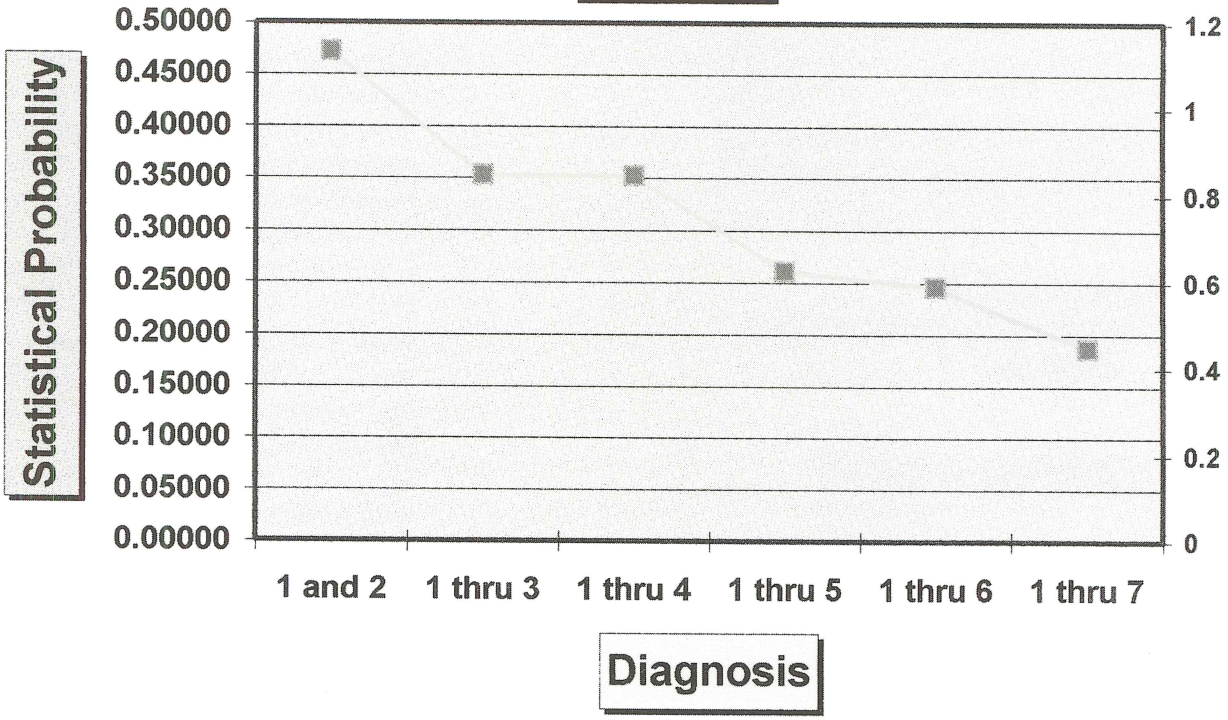
The data recovered for the palpatory findings in the extension plane also reveal non-significance, but the priority of sequence varies from the results explained above. More specifically, for uncoupling ($p=0.80$), coupling ($p=0.70$) and NC/NU ($p>0.98$). The p values demonstrate that each diagnosis occurred at random. Uncoupling (38.2 %) occurred at a greater frequency than coupling (26.9%) and NC/NU (34.8%) (Table 7).

According to the data collected for Experiment 3, 97 percent of the findings collected showed a change from the initial to the final diagnosis. Table 9 represents a summary of the kappa values that were calculated after each succeeding diagnosis was made (i.e. kappa values were calculated after diagnosis 1 and 2, then 1, 2 and 3, and so on). The kappa coefficients varied from 0.116 to 0.486, which are considered slight to moderate concordance (Table 4). As seen in Table 9 there is a decreasing trend of kappa values. This trend may be clinically significant because it may offer an explanation as to why a passive motion testing effect may not result in a high percentage of agreement among examiners. As each succeeding physician diagnosed each subject, the initial diagnosis (or motion preference) of C3/C4 may have undergone serial changes during the multiple passive motion testings of that vertebral segment. Thus, it may not be possible to obtain an objective measurement of interexaminer reliability testing because multiple diagnostic palpation of a vertebral segment may also provide a concurrent form of treatment, or at least an alteration of the original observed findings. Also, the kappa values calculated for intraobserver reliability for experiment 3 showed slight concordance ranging from 0.022 to 0.074 (Table 10).

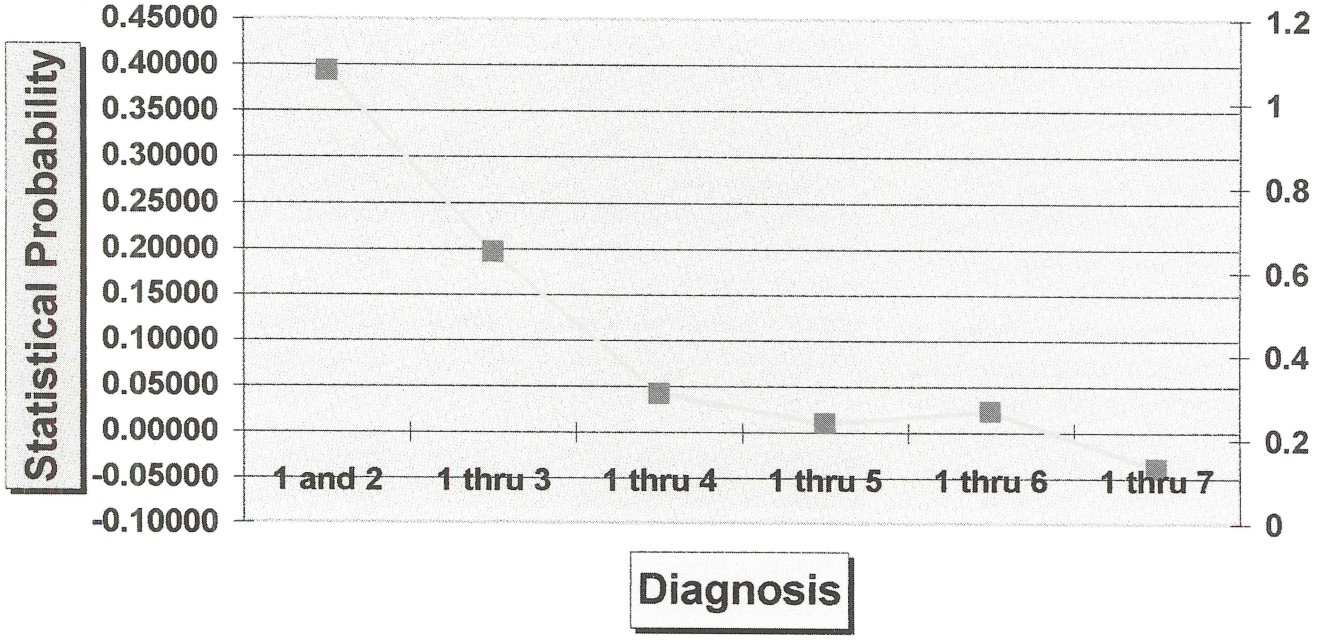
Graph 2 indicates that the statistical reliability of interexaminer testing also shows a decreasing trend (increased palpation is related to decreased agreement among examiners) in the kappa values. The ambulating group was found to have greater variability in the kappa values than was seen in the non-ambulating group. Thus, this also may explain the decreased interexaminer reliability in Experiment 2.

The chi-squared calculations for experiment 3 demonstrate that the diagnoses made by the examining physicians significantly differed from random ($p<0.001$) (Table 11). These p values reflect a basis to conclude that there was a significant interexaminer reliability for experiment 3 and that the decreasing trend of kappa values (Table 9) may be due to factors other than lack of agree-

Experiment Three
Kappa Values for Inter-examiner Reliability on the Stationary Group
Graph 2



Kappa Values for Inter-Examiner Reliability on the Ambulatory Group



Summary of Raw Data in Experiment 3
Table 11

Diagnoses	Total Agreement (Observed)	Mixed Agreement (Observed)	Total Disagreement (Observed)	Total (Observed)	Chi-Square	P Value
1 through 3	10	8	2	20	31.1	>0.001
3 through 6	11	8	1	20	20.4	>0.001
Chance for Total Agreement (A): 3/27 = 1/9 Chance for Mixed Agreement (M): 18/27 = 2/3 Chance for Total Disagreement (D): 6/27 = 2/9			Expected (A): 2.22 Expected (M): 13.3 Expected (D): 4.44			
X^2 = (total agreement)^2 + (mixed agreement)^2 + (total disagreement)^2						

ment. Moreover, kappa coefficients represent a measure of the proportion and strength of the agreement, but not it's significance. The diagnoses made by each physician between the first (diagnoses 1 through 3) and the second halves (diagnoses 4 through 6) of experiment 3 changed, but the significance of the agreement between examiners remained (Table 11). The discrepancy that is observed between the initial and final diagnoses may be further explained by ambulation (gross motion of the spine) in addition to dynamic motion testing (movement of a specific segment of the spine). It should also be mentioned that the examiners used in the third experiment were also participants of the second experiment, lending additional credibility to their technique of palpation in Experiment 2.

Discussion

The three major objectives of this project were: first, to determine if rotation and sidebending follow Fryette's biomechanics of the cervical spine for C3/C4; second, to assess the reproducibility of the findings; and third, to test the sensitivity of motion induced changes on the palpatory diagnosis among interexaminers. This was done exercising a standard protocol of osteopathic palpatory diagnosis by qualified physician examiners.

The diagnosis of motion preference of the third cervical vertebra was done by passive motion testing by physicians, board certified in osteopathic manipulative medicine. The issue of bias amongst examiners, in terms of preconceived notions of rotation and sidebending occurring to the same side, were important to address early on in the experimental process. In Experiments 1 and 2, rotation and sidebending were tested as two separate variables among the different examiners. Simply stated, the examiners never simultaneously tested rotation and sidebending in any given subject. This prevented the osteopathic physicians from relying upon their educational background and preconceived notions of spinal mechanics, which have traditionally been based upon the Fryette model.

This research project is a new in vivo approach to challenge the principles ordinarily taught in the standard literature and curriculum. Most of the studies conducted in the past have been in vivo and in vitro studies to test a hypothesis concerning the biomechanics of the cervical spine, but not specifically to test the validity of Fryette's theory of cervical spinal motion.

Our research looked into the nature of motion of the cervical spine, in particular the third cervical vertebral unit. The data collected demonstrated that rotation and sidebending may not conform to Fryette's hypothesis, which states movement of a single cervical segment demonstrates same-sided coupling. Both experiments 1 and 2 demonstrated that coupling was less frequent than uncoupling, and that uncoupling was more commonly found. The presence or absence of somatic dysfunction was not affected by the type of diagnosis (i.e. uncoupled, coupled, NC/NU, no finding) in Experiment 1. Furthermore, the findings for coupling and uncoupling were reproducible between Experiments 1 and 2 (refer to Table 8). In experiment 2, uncoupling also occurred more commonly in all three planes (flexion, extension and neutral). It is important to note that this study did not examine the thoracolumbar spinal mechanics, and therefore we do not propose that Fryette's second law of spinal motion is not applicable below the cervical region. However, the differences in configuration of the cervical to distal spine may provide an explanation for our findings.

The cervical spine, by nature a lordotic structure with an anterior convexity, has a greater axial rotation than its thoracolumbar counterparts. Anatomically, this fact may be due to a greater disk to vertebral body ra-

Muscle Mechanics
Table 12

Muscle	*Sagittal Action*	*Horizontal Action*
Semispinalis Capitis	Extension	Rotates head to opposite side
Semispinalis Cervicis	Extension	Rotates spine to opposite side
Multifidis	Extension	Rotates segment or spine to opposite side
Rotatores	Extension	Rotates segment or spine to opposite side
Intertransverse	Extension	Sidebends segment or spine to same side

tio found in the cervical region as compared to the other regions. The sagittal curvature found in the cervical spine may predispose it to more neutral spinal biomechanical motion than has previously been described, increasing the likelihood of uncoupled motion. The lumbar spine, another lordotic structure, has also demonstrated to exhibit uncoupled motion.[12] Perhaps the lordosis may be an influence for rotation and sidebending to occur in opposite directions at the segmental level. Percy[12] suggests that the lordotic shape of the lumbar spine together with muscular control are the two principal factors affecting the combined motions of rotation and sidebending.

Gray's Anatomy[4] states that the short restrictors of the cervical spine are the intertransversarii, multifidis, and rotatores muscles, the latter not being fully developed and exhibiting variability. Lateral flexion is influenced by the intertransversarii and multifidis. Rotation is affected by the multifidis and the rotatores (Ibid). Pansky[22] states that the multifidis, rotatores, and the long restrictors such as the sternocleidomastoid, semispinalis cervicis and capitis rotate the cervical spinal column to the opposite side (Table 12). The intertransversarii muscles exert lateral flexion to the same side. The interspinalis muscle, also a short restrictor of the cervical region, is a midline muscle unit and therefore, does not influence coronal and horizontal motion to the degree of the lateral fasciculi (short restrictors). Basmajian and De Luca[23] concede that the intrinsic muscles, specifically the multifidi act more to stabilize than to move the cervical spine. A proposed mechanism that may be used to explain uncoupling during passive motion testing as supported by descriptive anatomy may be due to the synergistic action of the intertransversarii, multifidi and rotatores muscles. The intrinsic as well as the long restrictors of the cervical spine rotate and sidebend the neck to the opposite sides.[22] The anatomy may inspire further analysis of the *gross or group* motion of the cervical spine. To assume that intervertebral motion is exclusively due to diarthrodial joint mechanics (articular facets and the joints of Luschka) ignores the potential influence of soft tissue on the cervical spine.

Beckwith's[24] emphasis on vertebral mechanics lends support to the possibility of uncoupling in the cervical spine. Radiographic imaging studies conducted by Beckwith demonstrated that rotation could occur as an isolated lesion. Beckwith further documents that rotation and sidebending in contralateral directions are coexistent and coextensive just as they are in ipsilateral motions of the cervical spine. This study's findings may further confirm the coexisting nature of rotation and sidebending in coupled and uncoupled patterns.

The motion patterns of the upper thoracic spine have been compared in literature to be similar to that of the cervical spine. Penning and Wilmink[25] offered an explanation of the mechanism on the motion characteristics of the upper thoracic spine in relation to the cervical spine. They theorized that the heads of the ribs mimicked the role of the uncinate processes in the cervical spine in guiding the combined motion between lateral flexion and axial rotation. Willems[11] conducted an in vivo study, which demonstrated that there is a relatively equal incidence of ipsilateral and contralateral patterns of lateral flexion combined with axial rotation in the upper thoracic region. This may be explained by the morphological similarity between the upper thoracic and the lower cervical spines, with the first two thoracic vertebrae exhibiting joints of Luschka.[25] It may be presumed that the contralateral motion patterns in the upper thoracic spine found by Willems may also occur in the cervical spine.

During the course of this study, it was found necessary to address the issue of interexaminer reliability. Does a lack of agreement amongst diagnosticians mean that a finding is not objective? Interexaminer agreement and intraobserver reliability were tested in separate experiments. There was a lack of inter- and intra- examiner agreement in Experiment 2. Presumably, in order for interexaminer reliability to be valid, one needs the examiner to agree with their own findings. However, the very notion of agreement within a group and oneself must be called into question when a palpation is induced dynamically or passively. O'Haire[26] states that the greater agreement within the observers themselves than between interexaminers may be due to systematic intraobserver error. Passive motion is a dynamic palpation, and it may change the initial diagnosis. This may occur, not only among a group of qualified examiners, but also

Summary of Kappa values: Inter-Examiner Reliability in Experiment 2 Table 13

Plane	*Diagnosis*	*Kappa*
Neutral	Side-Bending	0.007218
	Rotation	0.033643
Flexion	Side-Bending	0.047205
	Rotation	0.047278
Extension	Side-Bending	-0.612110
	Rotation	-0.041000

Intra-Observer Reliability in Experiment 2

Physician	*Diagnosis*	*Kappa*
Dr. A	Side-Bending	0.254079
	Rotation	0.391304
Dr. B	Side-Bending	0.394322
	Rotation	0.387980
Dr. C	Side-Bending	-0.358490
	Rotation	0.079295
Dr. D	Side-Bending	-0.160080
	Rotation	-0.021460
Dr. E	Side-Bending	0.467085
	Rotation	0.097744

within the successive palpations upon a subject by one clinician. Repeated passive movement, whether by multiple examiners or by one examiner, may change the initial diagnosis. In fact, repeated dynamic motion testing is not unlike "springing" which is an articulatory technique involving passive movement.[27] A diagnosis of motion preference such as rotation, sidebending, flexion or extension is not a fixed, objective finding in the face of induced passive motion.

Increased repeated passive motion testing will change the initial diagnosis for other examiners, as well as for the initial examiner. Greenman[28] states that passive (and active) motion testing at the segmental level is by nature therapeutic and results in a change from the initial finding. According to Becker[29] the art of palpation involves an experience akin to quantum physics in which the observer is an active participant in the treatment process. Dynamic palpation may follow the principles of quantum mechanics whereby the observer becomes a participant in the final outcome of the experiment.

The final experiment addressed the issue of low interexaminer agreement in Experiment 2. Experiment 3 had more of a favorable interexaminer reliability than the previous study. In experiment 3 there was a decrease in kappa values, which means that the diagnosis from the first to final palpation changed consistently. This seemed to be true for both interexaminer and intraobserver reliability. Indeed, the data analysis showed statistical variability between those examined who were ambulating between successive palpations, and therefore may further explain the discordance between examiners in Experiment 2. The data analysis of Experiment 2 demonstrated poor to slight interexaminer concordance with kappa values ranging from –0.612 to 0.0472. The kappa values for intraobserver demonstrated poor to fair agreement and ranged from –0.258 to 0.394 (Table 4, 13). The protocol for experiment 3 did not have the parameters in place to allow the examining physicians to distinguish between motion preference and the presence or absence of somatic dysfunction. Passive motion testing could theoretically be more likely to induce a change in the findings of a vertebral segment with no motion restriction, than one, which has been chronically restricted. The pattern of change varied with each subject. Some subjects went from a dominant sided diagnosis to no motion preference, and then to the opposite side of the original diagnosis. Other individuals went from one dominant side to the other without passing through an intermediary phase (i.e. no finding) (Refer to Table 14). In future experiments involving interexaminer reliability, more resistant somatic dysfunctions may serve as controls to determine agreement amongst examiners.

In any research project, one area of concern that must be addressed during analysis of the data is the possible cause and interruption of experimental error. The magnitude of subjects seen for diagnosis by the physician examiners is not that of a typical office setting. During the process of diagnosing a large number of subjects in a time frame of approximately four hours, other aspects should be considered. There are various reasons that may be used to explain the changes observed in the interexaminer results: one, the technique used by each examiner may have been different; two, examiner fatigue; three, diagnosis of the wrong segment; and four, palpatory error in making a diagnosis. Although each of these potential errors may have occurred during the experiments, they may not be the causative factors of variability in diagnosis. The authors would like to address these concerns: Passive (dynamic) motion testing (and ambulation as demonstrated in experiment three) would be the most likely explanation for a lack of inter- and intra- examiner agreement. Mo-

Raw Data For Experiment 3
Ambulating and Stationary Groups
Table 14

Subject No.	Stationary/ Ambulating	Dx 1	Dx 2	Dx 3	Dx 4	Dx 5	Dx 6	Dx 7
A	S	L	L	L	L	L	L	R
B	S	L	L	N	N	N	R	R
C	S	R	R	R	R	R	R	R
D	S	L	L	L	L	R	R	R
E	S	L	L	R	R	R	R	L
F	A	L	N	R	R	R	N	L
G	A	L	N	R	R	R	R	N
H	A	R	N	R	R	R	N	L
I	A	R	R	R	R	R	R	N
J	A	R	R	R	R	R	R	L
K	A	R	R	R	N	L	L	L
L	A	L	L	N	R	R	R	R
M	A	R	R	R	R	R	N	L
N	A	R	R	R	R	R	R	L
O	S	R	R	R	N	L	R	R
P	S	L	R	L	R	L	R	L
Q	S	L	L	N	R	R	R	R
R	S	N	L	L	N	R	R	R
S	S	R	R	R	R	R	R	R
T	S	R	L	L	L	L	L	L

tion induction (passive/dynamic) whether by an examiner or by the gross motion of walking could alter an otherwise static and clinically insignificant finding. The first and fourth issue of concern may be addressed by the fact that the examiners were instructed to follow the protocol for diagnosing rotation and sidebending prior to each experiment in order to standardize the methodology: uniformity enhances validity. Secondly, although the experiments ran a maximum duration of four hours, an osteopathic physician does not ordinarily see a hundred or more patients in this amount of time. However, our examiners typically have more than four hours of patient (hands on) contact, which includes not only diagnosis but treatment as well. This would argue against inaccuracies and fatigue amongst any particular examiner. Lastly, although the first two studies did not include a label at the C3 vertebra, in the last experiment it was clearly marked for the examiners to use as an anchor for palpation.

From a purely scientific perspective, interexaminer reliability of palpatory findings is difficult to assess because there are no objective measures established in osteopathic experimental science that may be used. There is no global standard on how to measure the accuracy of passive motion testing, and none to demonstrate that everyone palpates and perceives their findings in the same manner. According to Beal,[30] motion sense constitutes the culmination of palpatory skills and is the *limiting factor* in the art of manipulation. There is no standard with which to compare physician's palpatory diagnoses once they have made them. If the diagnosis can be verified with another scientifically acknowledged method, then that could provide sufficient evidence based validity on the osteopathic approach to diagnosis of the cervical spine. However, Deboer, et al[31] in a "Reliability study of detection of somatic dysfunctions in the cervical spine," determined a 40-60% agreement among examiners. This seems to be the norm even from well-established procedures such as reading electrocardiograms (EKG's). Moreover, the effects of soft tissue influence, inherent joint mechanics, method of diagnosis and passive motion testing may offer an explanation to the complexity of diagnosing motion preference in the cervical spine.

Conclusion

Fryette's second law of spinal motion may not fully apply to segmental motion in the cervical spine at the C3-C4 level according to the series of experiments represented by this article. They included nearly three hundred subjects and eight osteopathic physicians board certified in osteopathic manipulative medicine. In fact, rotation and sidebending in the same direction at C3 occurred less than 35% of the time. A statistical analysis of interexaminer reliability demonstrates that high levels of concordance may not be expected in the face of repetitive dynamic motion testing because physician induced movement can change the original motion tendency. The data obtained from all three experiments suggests that spinal motion in the cervical spine is at least uncoupled and at best not totally adherent to Fryette's theory. It is the authors' goal to present findings so the student and practitioner of osteopathic medicine will diagnose and treat the cervical spine according to their palpatory findings and not strictly on biomechanical theory.

This study has demonstrated that rotation and sidebending of the third cervical vertebra may move in opposite directions slightly more so than ipsilateral directions in the neutral and sagittal planes during physician induced motion testing. These findings do not support the principles of Fryette as applied to the cervical spine. As a result, the standard osteopathic curricula, which state that coronal and horizontal motion in a specific vertebral unit should move

in a coupled, or in the same, direction is brought into question. Although mathematical, computer, and post-mortem models[13,25,32] have confirmed Fryette's principle with regards to segmental motion, there are a limited number of models in the literature that include soft tissue influences. One in-vivo study demonstrated uncoupled motion at the upper cervical spine, inclusive of C2-C3.[14]

The purpose of this study was to demonstrate that Fryette's principles are not always applicable in predicting spinal motion of the mid cervical region. In fact, rotation and sidebending of a single vertebral segment, in this instance the third cervical vertebra, can display uncoupling, or contralaterality in the coronal and horizontal planes. The validity of our findings may be challenged by the perception of lack of inter- and intra-examiner reliability findings. However, due to the repeated induction of passive, or dynamic motion testing on a single vertebra by multiple examiners (including the possible effects of ambulation) it is not unreasonable to expect a change from the first diagnosis or original motion preference to the final diagnosis. In sum, motion at the third cervical vertebrae may demonstrate both ipsilateral (null hypothesis) and contralateral (central hypothesis) motion in a predictable manner (with a slight preponderance for uncoupling or motion in the opposite directions for rotation and sidebending) in all planes of motion. Further, passive motion testing may alter the original diagnosis or motion preference.

The practitioner of osteopathic diagnosis may consider the axiom, which is attributed to Fred Mitchell, DO, FAAO: "Treat what you find....not what you looking for!"[33] The findings of variability in motion and diagnosis in the cervical spine should be included in the education of our osteopathic students.

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Digging On: Some thoughts on the integration of Russellian Cosmology and Osteopathy

Paula D. Scariati, DO, MPH

Lao and Walter Russell, by many accounts, were two visionaries in the fields of science and philosophy. Devoted to a life of service and education, they wrote and lectured extensively on subjects aimed at assisting man in unfolding his higher Self. Their style was to pragmatically assert postulates on a scientific foundation and ask their students to observe these truths in nature and during inward contemplation to Know the basis of Universal Law, Natural Science and Living Philosophy.[1]

In 1988, as an osteopathic medical student and fellow immersed in the philosophy of Andrew Taylor Still, the Russell writings held very little interest for me. Yet they came to my attention on several separate occasions during lectures given by Robert Fulford, DO. Known as a humble man of few words, Dr. Fulford was held in the highest regard by many osteopaths for the powerful nature of his treatments. This became plainly evident to me when an osteopathic fellow in my college was hurt during a cranial course. It was thought that a poorly performed intraoral technique had lesioned the sellae turcica causing a disruption in the normal functioning of his pituitary. He suffered with multiple imbalances as he sought corrective treatments from many well-respected osteopaths. It was at the hands of Dr. Fulford that he was restored to a balanced functioning state. The results of his work made Dr. Fulford legendary. As such, I paid close attention to him hoping to garner information that would help me better understand the nature of his treatments.

During several of his public speaking engagements, Dr. Fulford referenced a handful of people who had influenced his work as an osteopath. He spoke of an IBM scientist named Marcel Vogel[2] and his work with a specific type of crystal; he recommended the writings of several people including a Yale physicist named Harold S. Burr [3]; Dr. Richard Gerber[4,5] ; Dr. Robert O. Becker[6]; and Walter Russell[7]. Eager to know what Dr. Fulford knew, I bought a Vogel-Cut™ Crystal and thoughtfully read Dr. Gerber's book. I forced my way through Dr. Becker's book and felt helplessly lost in Dr. Burr's writings. It was several years before I contacted the University of Science and Philosophy to order a copy of the Russell's home study course. I recalled Dr. Fulford saying how he had gone through that course five times. This inspired me, yet I was certain the content of the course would be over my head.

It has been several years since my initial purchase and I am currently making my way through the Russell course for the third time. In short, I have found it to be the most provocative writings I have ever had the pleasure of reading. They are plain and understandable, but more importantly, meditating upon these writings has given me insights which have proven to be fruitful additions to my osteopathic practice. My purpose in writing this article is to share some of the concepts put forth by the Russells and explain their influence on my approach to osteopathy. It is my hope that this might inspire others to share their experiences with the Russell writings and yet others to embark on a study of this work to bring forth more truths as they endeavor to "Dig On".

Background

First published in 1951, the Russell's home study course is divided into 12 units with a total of 48 lessons and is 933 pages in length.[1] While tempting to embark upon it as one might a good novel, it demands a slow, contemplative approach. There is no surprise ending; no heroine; no punch line. Profound truths are interlaced through the pages which stimulate you to expand your Mind and contemplate your life and your work in a new way. Let us touch upon some of the concepts presented by the Russells (quoted in bold type on next page) and discuss their potential impact on osteopathic thinking.

As we embark upon this discourse it is important to note that the words God, Jesus, and Christ will be used. These words invokes a wide variety of emotional responses commensu-

rate with individual belief systems. Here, the word God denotes the intelligence that permeates all things; Jesus refers to the master who had a ministry among men over 2000 years ago; and Christ denotes a state of consciousness which indicates the highest alignment of a person with self. No particular religious doctrine is suggested or endorsed.

Cosmology and Osteopathy

"Mind is spiritual and constitutes the invisible universe of CAUSE. Matter is physical and constitutes the visible universe of EFFECT." "CAUSE is the desire-energy within mind to manifest Mind-Idea by extending light-waves of thought from centering fulcrum points. EFFECT is manifested Mind-Idea expressed by motion of extended light-waves of Mind-thinking. God — the creator — is CAUSE. The created universe is EFFECT."

Osteopathic physicians are constantly engaged in the art of sleuthing. We are forever pressing ourselves to know why something has occurred so we may elucidate and correct its underlying cause. This desire to know causality gives us reason to pause and reflect the above statements carefully. Cause is Mind; Cause is God; Cause is the desire to manifest Idea. If these statements are true, where does one go to elucidate Cause? How does one explore the Mind field? How does one Know God? The waters get deep quickly.

In her book, *Infinite Mind: Science of Vibrations of Consciousness,*[8] Valerie Hunt discusses her groundbreaking research aimed specifically at exploring the Mind Field. She gives a number of examples where inquiry into mind field issues results in profound healing. In the companion workbook, *"Mind Mastery Meditations",*[9] she offers us tools for developing these skills. In addition, there are types of guided imagery work[10] aimed at honing skills to explore the mind field from a different vantage point.

The Russells advocate meditation as the preferred method to Knowing God. They carefully define the process in the home study course to make it approachable by all. While not a difficult process, meditation may be a difficult practice to initiate as most minds are deconditioned and respond poorly to the discipline of silencing external sensory experience. Many novice meditators report their minds running wild with thoughts about everything from the shopping list to the wart they saw on Great Aunt Sally's toe when they were two years old. Those who practice the art of Zen have a term for this — "monkey mind". Persistence is important, though, as practice truly makes the master.

From an osteopathic point-of-view, a meditation practice may provide other benefits, too. First, it can facilitate a heightening of ones perceptive skills. While most osteopathic physicians are quite adept at palpatory diagnosis, meditation promotes the development of the mind's eye in a way that enhances perception beyond the five senses. Second, there is often an improved ability to focus, hold and direct intent. We will talk of this more below, but suffice it to say that such skills decrease treatment time and enhance treatment specificity. Finally, it becomes easier to interface with the Intelligence of the person you are treating. This guides the treatment process in the most productive manner possible.

Several years ago, Dr. Andrew Weil, popular author and Director of the Integrative Medicine Fellowship at the University of Arizona Medical Center in Tucson, did a video documentary of Dr. Fulford. Toward the end of the piece, he asked Dr. Fulford for his advise to practicing physicians today. After a thoughtful pause, Dr. Fulford recommended that physicians focus more on finding the cause of the problem they were seeking to treat. Perhaps, Dr. Fulford was speaking of cause in the way that we have explored here. Furthermore, I believe that Dr. Still was referencing this same idea when he admonished his students to find and treat health, not disease. Health is the cause, disease, the effect.

"Just as science conquered smallpox and other dread scourges through knowledge of CAUSE where magic and witchcraft failed, so must you acquire God-powers through scientific knowledge of CAUSE where oft repeated affirmations, emotional worship and doctrine creeds and beliefs have failed to get you farther than a peephole into the light."

* * * * *

"The UNDIVIDED is eternally balanced for it is ONE." "The DIVIDED ONE is eternally unbalanced for it becomes TWO." "The UNITED TWO can become a balanced ONE only if each mate of the TWO is equal."

The above quotes refer to the concept of balance rhythmic interchange. The Russells coin this phrase to describe how ALL interactions in, nature must occur: equal and opposite so as to merge and cancel each other out. Let us define this concept so we can explore its importance to the osteopathic concept.

God is the undivided, eternally balanced One. Through His thinking he divides himself into sex-paired, wave-forms that forever seek balance, but are unable to obtain it for now they are two. Thus, the divided two seeks to come together and remerge to become a balanced One. A resulting balanced One can only occur if the two halves coming together are equally balanced. If they are unbalanced, the unification process results in a residual imbalance which, according to the Russells, is the under-

lying cause of the woes of mankind.

This process is well illustrated with Figure 1, which depicts the joining of perfectly balanced elements in nature. Each of the three examples represents an equally divided and equally united pair of elements which completes a wave cycle of God's creative thinking.

Lithium and fluorine, which are polar opposite extensions from the undivided One, come together to form the perfectly balanced lithium fluoride. The same is true of sodium chloride, and potassium bromide. Now, let us consider these pairs from the point of view of mismatings. If sodium mates with bromine, they will get along well enough as long as chlorine stays out of the way. If chlorine is introduced, though, there will be a divorce between the sodium and the bromine more surely than with a mismated man and woman. If one tries to combine elements that are further apart in their electrical potential, frequencies and pressures, a more severe disharmony would result. This is the basis of explosives in chemistry and explosives in human emotions.

Another simple example which exemplifies this concept is holding your breath. If you hold your breath long enough, you will, at some point be forced to exhale with a good deal of force to balance out your breath cycle. Your heartbeat operates under the same principle although it is not as easily amenable to your conscious will as your breath. Both your heartbeat and your breathing function in perfect balanced rhythmic interchange.

Osteopaths currently utilize many techniques that honor this concept including balanced ligamentous tension, the induction of a stillpoint, or balancing of the reciprocal tension membrane from Sutherland's Fulcrum. It is a powerful concept to employ in rebalancing the body and can be applied more broadly to work with the chakras, glands, visceral organs, nervous system and the lymphatics. At its essence, balanced rhythmic interchange is about restoring the equilibrium that must exist between cause and effect.

"It is the RESIDUE OF UNBALANCE in all mismatings which is the basis of every trouble in the world, its ills, its frustrations, its wars, sickness, enmities, bankruptcies and all other effects we call BAD and do not like to have happen to us."

"God's Soul is the Universal Soul — and you are that Soul."
"God's Mind is the Universal Mind – and you are that Mind."
"God's thinking is Universal thinking —and His thinking is your thinking."
"God's body is the Universal body — and you are that body."

Well, what does this have to do with osteopathy and healing? Many historians, scientists, and theologians have pondered the miracles that Jesus reportedly performed. If these accounts are correct, Jesus would be the greatest healer ever documented by history. Yet, little to nothing is known about how he did this. The Bible tells of his touching a person or a person touching the hem of his garment and being healed. The Russell writings give us some insights into this phenomenon.

Jesus, was a master who attained Christ-consciousness. According to the Russells, this is the highest attainment of God-Consciousness possible; Jesus was in perfect balance with his God-nature. When he said "I and my father are one"[11], he was not being cryptic. It was by this union in Christ-consciousness that Jesus was able to extend balance (healing) to others.

One other statement that Jesus made, deserves consideration: "Most assur-

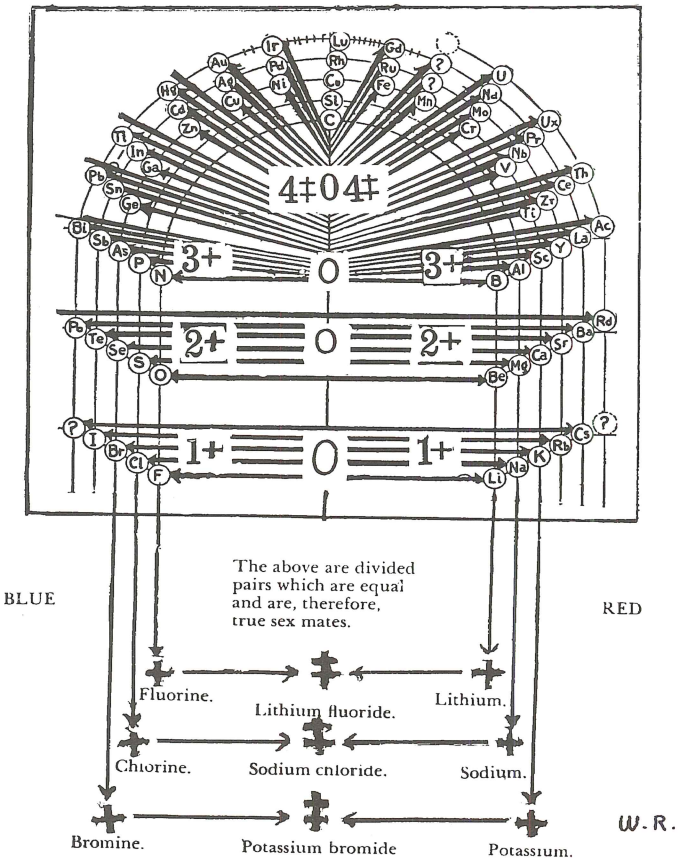

Figure 1: Nature knows no other process than that of SIX DIVISION AND SEX UNITY

edly I say to you, he who believes in me, the works that I do he will do also; and greater works than these he will do..."[12]. Jesus made it clear that he was showing people a path that they, too, could walk. If you currently have a meditation practice or embark upon one, take some time to contemplate this thought further. You will be challenged to expand your thought process until you know that you are one with All-That-Is. This is a powerful place from which to treat as you "dig on" in the fashion of osteopathy's founding father, Andrew Taylor Still.

"God alone can CREATE. Man cannot create until he becomes aware of the God-Mind, which centers every cell of him, and every tube of growing tree, and all other things in all this universe, which God alone creates."

* * * * *

"Concentric thinking produces formed, dense, visible bodies from invisible space by compressing large volumes of low potential into small volumes of high potential. Concentrative thinking is compressive, It focuses to a point. It is positive. It charges bodies with the power to move. It builds imaged form bodies in the image of the Creator's imagining."

"Decentrative thinking disintegrates dense bodies and returns them to invisible space. It dissolves, voids-discharges and depolarizes charged bodies and deprives them of their power to move."

As a medical student, I attended a cranial course where John Harakal, DO spoke about a treatment given to him by Rollin Becker, DO. Dr. Harakal noted that he had severe degenerative problems in his knee and after exhausting all other options, was scheduled to have a knee replacement. He relayed this story to Dr. Becker who offered to treat him. Dr. Harakal went on to tell how Dr. Becker took hold of his knee and how his knee became very hot. The conclusion of the story was that Dr. Harakal did not require a knee replacement. I was fascinated that an osteopathic treatment could produce such profound results, yet frustrated that no one had taken it a step further to hypothesize what had happened. Over the years, as I would treat patients, some would note how warm my hands were while others would feel chilled after a treatment. Still, I did not understand. It was in reading the above passages that I first had a glimpse into what might be happening.

As the Russells explain, there are two types of thinking, concentrative and decentrative. Concentrative thinking is compressive, centripetal, positive, charging, heat-generating and it is the process used to manifest matter. Decentrative thinking is expansive, centrifugal, disintegrating, discharging, heat-dissipating and is the process used to break down matter. These processes are depicted in Figure 2.

If we apply these concepts at a cellular level, we would be talking of cellular differentiation and dedifferentiation. Could this be a mechanism by which Osteopathic treatments align with human physiology?

During a recent course I attended, Dr. Viola Frymann recounted a story which occurred while she was in Russia demonstrating Osteopathic techniques. She was asked to treat a child with a conduct disturbance. As part of her exam, she noted the child had an osteochondrosis of the elbow, but felt that this was the realm of the Orthopedic surgeon and did not give it her attention. She proceeded to treat the

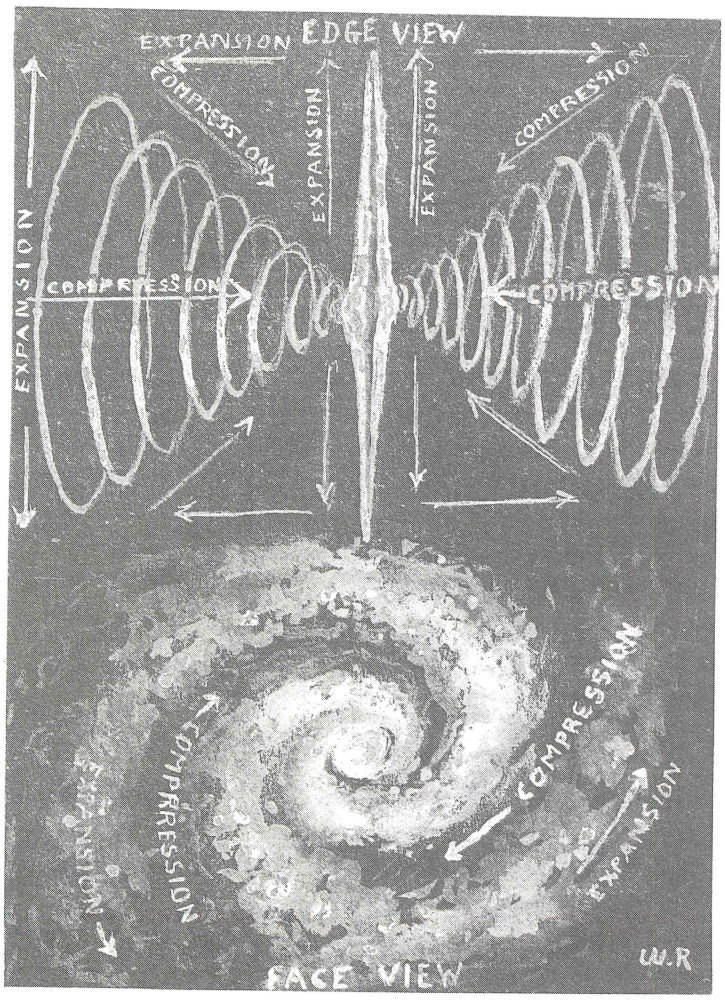

Figure 2: the inbreathing-outbreathing life-death cycle which motivates the universe.

child and was pleased with the resulting improvement in his behavior. Some time later, she received a call from the Russian delegate. They wished to come to San Diego for a visit to better understand Osteopathy. They were with her for several days when she finally asked what inspired them to come so far to learn more about Osteopathic Medicine. They asked if Dr. Frymann had remembered the young boy she had treated. Yes, she did. An x-ray performed several months after Dr. Frymann's treatment revealed a bone in the boy's forearm where only a fibrous cord had been previously. They were interested in knowing what Dr. Frymann had done during her treatment to promote this. Dr. Frymann, too, was interested in knowing what she had done.

Robert 0. Becker studied the phenomena of dedifferentiation in salamanders". He was struck by their ability to regenerate limbs after amputation in contrast to a close relative, the frog. He found that the salamander was able to dedifferentiate cells at the site of the amputation to a more primordial type of cell that could then be instructed by the body's intelligence to reproduce the necessary limb. He also found that by the tenth day, the primordial cells had organized themselves to a point of knowing what they were creating. So, if a leg was amputated and the cells that formed were placed at the site of a tail amputation before the tenth day, a tail would grow. If they were placed at the site of a tail amputation after the tenth day, a limb would grow.

While no such mechanism is know to exist in humans, the plausibility of such a process is not inconceivable. We know, for example, that many cancers have a more primitive cellular structure than the organ from which they derive, This means that the human is capable of producing such cells when called upon. At the very least, it would provide an entertaining explanation of Dr. Frymann's results in the above case scenario.

"The desire for division is accomplished by dividing his KNOWING into THINKING. Thinking is wave-recorded. Waves are the cause of motion."

"This is a universe of rest from which motion springs, in repetitive cycles, to manifest that which we call life, and is forever seeking rest in that which we call death, There is no death in all the universe. In these lessons we will make it clear that there are two directions for life, and that so-called death is but the direction of return to rest for a repetition of life".

The Russells thoughts on death are challenging because they oppose the concept of death embraced by most of Western society. In some of the other quotes taken from the Russells writings we have emphasized how you are one with God; we have talked about how you are Mind centering and controlling physical form through balanced rhythmic interchange. If these concepts hold within them Truth, how can there be death?

In his landmark book "*Many Lives, Many Masters*",[14] Brian Weiss speaks about regressing a patient as part of his psychiatric treatment only to find him describing, in vivid detail, the accounts of a life that predated his current one. Valerie Hunt, in her book "*Infinite Mind*"[8] also speaks of the eternal nature of the Mind and how one can carry over lifehood issues into each life until they are resolved.

This caught my attention from an osteopathic point of view as a result of treating a number of children diagnosed with Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD). During my initial assessment of these patients I was struck by the density and character of the restrictions I perceived in their bodies. Several mothers recalled how their children had exhibited anger and violence from a young age with no notable history of birth or other trauma. All had been medicated for many years to regulate their unbalanced behavior.

In pondering these kids, I was struck by the fact that they were all males. The occupational therapist that I work with confirmed that her clinic was full of young males with ADD/ADHD. She couldn't recall seeing a female child with this diagnosis. Fascinated, I started probing further in treatment sessions about the cause of the problem. On several, separate occasions issues of war and violence came to my attention. Could these kids be carrying over lifehood issues related to the wars of the last few generations? In light of the fact that ADD/ADHD was an unheard of diagnosis one generation ago, and the fact that the majority of ADD/ADHD diagnoses are made in males, and the fact that the violence and anger exhibited by many of these children doesn't seem commensurate with the experiences that they have had in this lifetime, the hypothesis seems plausible.

Regression studies or mind field work in the fashion of a Valerie Hunt with ADD/ADHD children may help better explore this concept to the satisfaction of the science-oriented medical mind. In the meantime, this hypothesis has helped me approach my children with a new perspective as to the depth and possible underlying cause of the problem.

"There is no death, however. A man is INCREASINGLY living until his maturity. After that he is DECREASINGLY living until he finds rest in the earth from which he will be reborn. Rest is not death, Rest is the source of life. It is the seed from which life springs, All "dying" bodies which seek rest do so to become revitalized as life. Vitality and life are one."

"..An equator, as applied to you, divides your body into two equal and opposite halves and each opposite half symmetrically balances the other half — but in reverse.

". . . equators are the dividing planes of the universal equilibrium. They, therefore, represent the undivided, the unchanging spiritual light from which the physical bodies of all things are extended."

With an understanding of embryologic development in mind, one reads the above statement with a sense of owe. Early development occurs around a structure that we call the primitive streak. In truth, though, the primitive streak is not a structure but rather a void, a groove, a space, or an axis into which things develop. It goes on to differentiate into the mesoderm, ectoderm and endoderm. In the next stage of development, another void called the primitive pit develops. From this space, extends a midline axis which we name the notochord that runs from the tip of the coccyx to the stalk of the pituitary through the center of each vertebral body. It is from this notochord that we see outpouchings differentiate into the various systems that compose a human embryo and fetus.

Osteopathically, we embrace embryology with great zeal because we find treating at this level to be powerful. But, why would the treatment of a developmental remnant or the memory of a developmental process be so powerful? Perhaps it is because it draws us back to that equator that served as the initial an axis for our physical differentiation and continues to be the fulcrum around which we attempt to balance our entire manifest life. If this is so, balancing from the midline becomes an invaluable and powerful tool in the Osteopathic armamentarium.

"Everything you are in thought extends two ways from your Consciousness which is located upon your equator. Your senses vibrate from that equator when your equator is out of balance with the universal equilibrium, and cease to vibrate when it is in balance with it."

". . a teacher can give you a technique for expressive your idea, but he cannot become your Soul from which your concept extends."

This final thought embraces the challenge that faces our colleges today in training Osteopathic medical students. When I was an Osteopathic medical student and Fellow, I spent innumerable hours studying the location of tender points, the correct positions for myofascial release, the right hand position for a CV4, etc. In short, I was a well-trained automaton who could mimic a variety of techniques as required. I knew the moves and I read the philosophy but my thinking remained linear. Every bug had its drug; every lesion had its correction.

Osteopathy became an art the day I conceded that the intelligence of the body was far more knowledgeable about how to heal the body than I could ever hope to be as a result of my book knowledge. I began to look at the whole person and listened to the body's wisdom which guided my thinking hands. I searched for the health and spent less time dissecting the disease. Soon, each touch, like a brush stroke in a painting, became mindful and added purpose to the picture. Today, I still often feel like I paint by the numbers, but I aspire one day to be a Michael Angelo.

"Vibrating wave bodies cannot KNOW anything, but can sense everything. Senses are but motion. Sensations are the repeated vibrations of motion. Sensation is in no way related to intelligence, knowledge or consciousness. MIND is the Knower and the Thinker. Thought-wave bodies are the workers."

Conclusion

Whether you agree or disagree with the concepts explored here within is inconsequential. If this paper has caused you to consider one new concept that you hadn't considered before, it has done its job. If this paper verbalized some issue that you've struggled with but haven't been able to solve, it has done its job. If this paper has pushed you to consider new areas in your personal growth or the treatment of your patients, it has done its job. If this paper has opened up a new arena of possibility for the budding Osteopath, it has more than done its job.

It was purposeful that specific techniques were not mentioned in the context of this paper, for techniques change as the conscious depth of the soul grows. The treatment I can offer today is unlike that which I could offer one year ago and will not likely resemble the treatment I give one year from today.

The words I leave you with are the words of Norman Vaughn. For me, they are a constant reminder of the work at hand amidst the craziness of a medical profession being crushed by a soulless bureaucracy: 'The only death you die is the death you die every day by not living. Dream big and dare to fail."

Post script:

Osteopathy's promise to humanity

I would be remiss if not to mention the state of the Osteopathic profession at the time of this writing. Circumstances invoke a state of bewilderment because some have suggested that up to 80% of licensed DO's haven't a clue as to the premise of their profession. This ignorance seems to have its roots in our colleges where the curriculum ensures comparability with our allopathic colleagues with an added competency in different manipulative techniques. Our governing bodies struggle to give us an identity that we can call uniquely our own, for within our home we have lost

our unique identity. Masters within our profession write of its death, while alternative practitioners adopt Osteopathic philosophies and present them in sleek, new, complimentary or integrative packages.

The time is at hand. In 1874, a single man embraced a vision with such determination that he changed forever the face of medicine. Does such fervor for this philosophy still exit or is it time for it to be relegated to a period of rest in wait of a rebirth some time in the future? For Osteopathy, as a practical and philosophically different branch of medicine, may die, but its precepts cannot. They are built on the very foundation of Natural Law and are immutable. Yes, indeed, the time is at hand

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Post-traumatic Headache of Cervical Origin

MonaLisa M. Mitra, OMS-IV and Scott T. Stoll, DO, PhD

Introduction

Headaches that occur as an immediate consequence of head trauma are often of short duration. The term post-traumatic headache, however, is synonymous with the term chronic posttraumatic headache and is applied to headaches that persist for months or years after the trauma. This type of headache usually occurs without associated skull fractures. Paradoxically, the incidence of chronic posttraumatic headache is inversely proportional to the intensity of head trauma.[1] According to the International Headache Society (IHS), the criteria for acute post-traumatic headache require that the headache begin within two weeks and disappear within two months of the trauma. The diagnostic criteria for chronic posttraumatic headache on the other hand require that the headache continue for more than eight weeks. There are two subcategories within these conditions. The first indicates that the trauma should be significant and is manifested by loss of consciousness or post-traumatic amnesia of more than ten minutes or abnormal clinical, neurologic, or laboratory examinations. The second subcategory indicates that mild or minor head trauma can evoke headaches even in the absence of signs and symptoms of brain dysfunction.

Case Presentation

Chief Complaint: A 53-year-old caucasian male presented with generalized pain over the left side of his body. The pain was most severe in his head and neck (7 on a scale of 0-10, with 0 indicating no pain and 10 being extreme pain). The symptoms, this time, started as tremors on the morning of the clinic visit. The patient also complained of moderate photophobia and claimed that he was finding it difficult to keep his left eyelid open. Any form of movement exacerbated the pain, which was alleviated by Flexeril.

History of Present Illness: The patient claimed an eight-month history of left-sided pain, numbness and tingling that started with a severe left-sided headache originating in the back of his head. He emphasized that the pain is always left-sided even though the location may shift from his upper extremities to his lower extremities and, occasionally, to his abdomen. The patient also stated that the left side of his body was more sensitive to cold and there was a generalized sensory deficit on this side. There have been about six or seven episodes thus far. He has also experienced occasional stuttering during these episodes. According to the patient, a recent MRI suggested an "abnormality" of the cervical spine.

Past Medical and Surgical History: The patient's medical history included hypertension, arthritis, gastroesophageal reflux disease, and depression. Upon inquiry, it was found that the patient had a long history of multiple traumatic injuries since childhood. His most recent head injury occurred in December of 2001 when he fell through the ceiling from his attic. Prior to this, he suffered three broken ribs in 1992. In 1983, he was hit by an overhead door and was almost rendered unconscious. He recovered from this incident in one week. He has had multiple motor vehicle accidents where he hurt his neck, lower back, and pelvis. In terms of childhood injuries, the patient recalled skating accidents, falls down the stairs, and falling from the bleachers. According to the patient, he did not suffer any long-term effects from these accidents.

The patient had a significant surgical history that included removal of a malignant melanoma in 2001; left rotator cuff surgery in 2000, right rotator cuff surgery in 1996, and a total cholectomy with ileostomy secondary to the diagnosis of polyps on colonoscopy in 1972. He also had surgery on his right knee, but was unsure about the time frame.

Family History: The patient's family history was significant for familial polyposis on his maternal side. His mother had colon cancer and is deceased. His father passed away from complications of abdominal cancer.

Social History: The patient is an engineer by profession. He does not use tobacco, alcohol, or other illicit drugs.

Allergies: The patient did not have any known drug allergies. He suffers from seasonal allergies in the fall and spring.

Medications: Following is the list of medications used by the patient at present: Clonazepam 0.5mg bid, Nexium 40mg qd, Zocor 20mg qd, Paxil 20mg qd, Verelan 300mg qd, Ecotrin 325mg qd, Hydrocodlapap 750mg PRN, Ibuprofen 800mg PRN, Flexeril 10mg PRN, Naproxen 500mg PRN.

Physical Examination: A complete neurologic and osteopathic musculoskeletal examination was performed. The neurologic examination showed 2+ deep tendon reflexes bilaterally, a positive Tinnel's test in the left wrist, and negative Phalen's test bilaterally. There was no atrophy in the muscles of the upper and lower extremities and muscle strength was intact and equal bilaterally. Electromyogram results showed no evidence of a peripheral neuropathy. However, there was evidence of a moderate to severe focal axonal/demyelinating sensorimotor neuropathy affecting the median nerve across both wrists, consistent with bilateral carpal tunnel syndrome.

The osteopathic musculoskeletal examination revealed a mildly shuffling gait with the left shoulder slightly higher than the right. There was a slight forward head carriage. The iliac crests were even bilaterally. Palpatory exam revealed several areas of somatic dysfunction. The cervical muscles were ropy. The OA joint was sidebent left, rotated right. The C2 through C6 vertebrae were sidebent right, rotated right. In the thoracic region, T2 through T4 were sidebent left, rotated right. The L5-SI joint was backward bent. Range of motion was decreased bilaterally in the upper extremities, but was normal in the lower extremities. Several tender points were palpated as follows: left sacroiliac joint, left piriformis muscle, the L5-SI joint and the left shoulder in the acromioclavicular joint and the supraspinatus muscle.

Assessment: A working diagnosis of cervicalgia was made. The left shoulder showed a sprain/strain pattern, particularly in the acromioclavicular joint and the supraspinatus muscle. The presence of various somatic dysfunctions in the cervical, thoracic, lumbar, sacral, pelvic areas were also diagnosed.

Treatment: The primary treatment modalities used were myofascial release, strain-counterstrain treatment of tenderpoints and balanced ligamentous tension. Diapragmatic release was carried out to facilitate the patient's breathing. Occipito-atlantal decompression was performed to release the strain in this joint. All techniques used were indirect due to the severity of pain being experienced by the patient. In addition, he was instructed on self-treatment of tenderpoints and daily stretches. He was advised to treat the tenderpoints three times daily and to stretch twice daily. He was asked to return to the clinic in about one week.

Results: At the end of the first 60-minute visit, the patient claimed to be feeling markedly better. His pain level was decreased to 3/10 from 7/10. In a follow-up telephone conversation one week later, the patient's wife said that he was very satisfied with the results of the first treatment. As predicted, he experienced some soreness for two days following the treatment, but had started to feel markedly well after that. Both the pain and numbness were decreased.

Discussion

Headaches are among the most common reasons for patient visits in medical practice. In medical writing, headache is considered to be the result of some form of noxious stimulation to the sensory nerves, such as pressure or traction on the pain-sensitive structures of the head, often with a psychogenic basis.

The annual incidence of head trauma in the United States is approximately 200 per 100,000. Statistics with regard to post-traumatic headache after injury to the head or neck (whiplash) range from 30% to 90%. These widely disparate numbers are due, in part, to the differing definitions of post-traumatic headache. If late-onset post-traumatic headache (beginning > 2 weeks after injury) is included, the incidence would be higher. Approximately one third of patients report persistent headaches 6 months after head injury, and about one quarter continue to have headaches after 4 years.[2] Chronic post-traumatic headache usually does not occur in isolation but is the most common symptom of what is known as post-concussion/post-traumatic syndrome. This syndrome is manifested by a group of symptoms that can be classified as somatic (especially neurologic), psychologic, and cognitive. After headache, dizziness is the most common symptom of this syndrome. Other somatic symptoms include photophobia, phonophobia, tinnitus, blurring of vision, and easy fatigue. Depression and anxiety are the most common psychological symptoms observed. They may be irritable, exhibit angry outbursts, and have frequent mood swings. Cognitive difficulties might include forgetfulness and difficulty in learning, although poor concentration and poor attention span as a consequence of the other symptoms might contribute to this .[3]

Headaches of cervical origin: Cervicogenic headache may be defined as pain perceived as arising in the head, but whose actual source is in the cervical spine. The role of the cervical spine in the etiology of headache is somewhat controversial. Head pain may be the initial complaint in diseases of the spinal cord. Cervical spondylosis, trauma, rheumatoid arthritis, and cranial vertebral abnormalities, as well as cervical and foramen magnum tumors may produce head and neck pain. In 1971, Lewit[4] reported

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on a series of 93 adults who had sustained head/neck trauma. Ninety-six percent of these subjects had movement restriction in the upper cervical spine. Osteopathic manipulation was found to be very successful in treating the headache associated with these injuries. In 1980, Ng[5] explored the association between static vertebral misalignment as seen on plain film xrays and the incidence of occipital headache. Thirty-eight subjects suffering exclusively from occipital headache were studied. This group was compared to an age and sex-matched control group. Lateral inclinations of C1, C2 and C3 were measured using a standardized xray marking technique; Lateral curvature of the entire cervical spine was also measured. Statistically significant differences were found between headache sufferers and controls in the incidence and degree of lateral tilting at C1 and C3, while a tendency toward a similar distortion existed at C2. No differences were found in the lateral spinal curve in the two groups.

Anatomic basis for cervicogenic headaches: In 1992, Bogduk[6] published a paper in which he discussed an interesting hypothesis correlating insults to the cervical spinal cord with certain headaches. The neurons that constitute the pars caudalis of the spinal nucleus of the trigeminal nerve are continuous with the apical neurons of the dorsal horns of the spinal cord. No intrinsic anatomical feature demarcates where the spinal nucleus ends and the gray matter of the spinal cord begins; yet within this continuous column one can identify a nucleus – the trigeminocervical nucleus. This is not a nucleus in the classical sense, as it does not possess a distinct cytoarchitecture or any other intrinsic morphological feature. Its rostral and caudal limits are defined by the common distribution of primary afferent terminals of the trigeminal and cervical nerves. Sensory axons of the trigeminal nerve carrying nociceptive information enter the spinal tract of the trigeminal nerve, which runs caudally lateral to the spinal nucleus, but these axons continue into the dorsolateral tract of the cervical spinal cord as far as the C3 or C4 spinal cord segment. The trigeminocervical nucleus can be defined as those cells in the upper three cervical segments that receive both a trigeminal and a cervical peripheral input. It serves as the essential nociceptive nucleus of the upper neck, head and throat. Whatever the actual innervation of structures in this region, noxious stimuli form them will be mediated by the trigeminocervical nucleus. The neuroanatomical basis for cervicogenic headache is convergence within this nucleus. In the absence of any other sensory information, second order nociceptive neurons in the trigeminocervical nucleus that receive both a trigeminal and a cervical input have no means of determining whether they are activated by trigeminal or by cervical afferents. In this situation of ambiguity, the brain, relying on familiarity with the more accustomed input, interprets the pain as arising from the trigeminal field and not from the neck. In the case of cervicogenic headache felt in the occiput, convergence occurs between deep cervical nociceptive axons and axons that innervate the occipital region.

Pathology of cervicogenic headaches: The etiology for these headaches can be quite varied. There may be traction on the components of the circle of Willis and other major vessels, especially the middle meningeal arteries. These vessels may be dilated due to fever, histamine release or back pressure. Traction may also be caused by alterations in intravascular blood pressure or cerebrospinal fluid pressure. Displacement of or traction on the venous sinuses can also lead to pain. Fluid stagnation or edema involving any of the cranial nerves might induce discomfort as well. These conditions might all be additionally associated with tension in the soft tissues at the craniocervical junction.[7] Accepted or verified causes of cervicogenic headache are rheumatoid arthritis and trigger points in the muscles innervated by CI-C3.[8] Other causes are speculative since pathological changes have not been corroborated. These include irritation of the dura mater, C2-C3 intervertebral disc injuries and post-traumatic arthropathy or joint dysfunction affecting the upper cervical synovial joints. The pathological nature of cervical synovial joint disorders remains unknown but the role of these joints in headache is strongly implicated by the presence of abnormal palpatory and motion findings and the relief of headache upon anesthetization of the involved joint.

Differential diagnosis: The differential diagnosis of cervicogenic headache should include space-occupying lesions of the posterior cranial fossa and aneurysms of the vertebral artery. These structures are innervated by the same nerves that supply the upper cervical segments. Therefore, the pain they produce is similar to pain from the cervical spine. These lesions, however, are far more life-threatening than those that affect the cervical spine. Another cause of chronic post-traumatic headache might be subdural hematoma, especially in the elderly because it may cause headache without other symptoms or signs and may occur after minor or unrecognized head trauma.

Treatment of post-traumatic cervicogenic headache:

Pharmacologic treatment: The treatment of chronic post-traumatic headache is individualized to the type of headache described by the patient. Tension-type headache is the most frequent manifestation of this condition, and prophylactic treatment with tricyclic antidepressants for their analgesic action is usually recommended. Divalproex,

gabapentin, and other anticonvulsants are also effective in suppression of chronic pain. Exacerbations may be treated with an analgesic but one must guard against the excessive use of these agents because of the potential for rebound phenomena and the perpetuation of chronic daily headache. If the headache has features of migraine rather than tension-type headache, beta adrenergic blockers and calcium channel blockers may be added to the regimen. Other antidepressants, such as SSRI's, MAOI's as well as antiserotonin agents may be used as second- or third- line drugs for migraine prevention. Emotional factors that aggravate the headache as well as depression and anxiety should also be treated. Medication for other associated symptoms, such as nausea or insomnia, improves the patient's quality of life.[1]

Osteopathic manipulative treatment: In a comprehensive review of the literature, accompanied by case presentations, Vernon (1991)[9] discussed the common osteopathic lesions observed, the treatment modalities employed, and results obtained. Hypomobility of one or more of cervical vertebra(e) facet joints associated with scalene muscle spasm and point tenderness were found to be the most common lesions upon palpation. Treatment options included manipulation directed at the hypomobile joint(s). This can be accomplished either with HVLA or indirect myofascial release. Direct muscle energy may be carried out to relieve the spasm in the scalene muscles, and Jones strain-counterstrain may be performed on the trigger points. Although the exact treatments used were not described in the paper, the results in all three cases presented, demonstrated the unequivocal effectiveness of osteopathic manipulative treatment. All three cases presented showed marked improvement within one week and complete resolution of symptoms shortly thereafter. The patients were discharged within 3 to 6 weeks. Therefore, while the mechanism of effect of spinal manipulation in cervicogenic headache is still speculative, the positive results certainly call for further investigation of osteopathic manipulation as an effective means of providing relief to these patients.

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Book Review

Reviewer: Anthony G. Chila, DO, FAAO

An Osteopathic Approach to Ear, Nose and Throat Patients: The Contributions of William C. McCarty, DO

Editors: Kurt P. Heinking, DO, Bill D. Hampton, DO, pp. 70.
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This volume is the first edition of a recent project from the Chicago College of Osteopathic Medicine (CCOM) OMM Department.

William C. McCarty, DO received his Doctor of Osteopathy degree with the 1949 Class of the Chicago College of Osteopathy. A special person in the hearts of all at CCOM, "Mack" has been teaching at the college for over 50 years, while continuously maintaining a private practice. He has served as surgeon, teacher, and Head of the Ear, Nose, Throat (ENT) Department. As chairperson of the Committee on Education of the Illinois Osteopathic Association, graduates of CCO were given the right to take the state examination for full licensing. This committee also secured legislative laws for all osteopathic physicians to take examinations for licensing in all aspects of practice of medicine and surgery. Additional service has been rendered as Chief of Staff, CCOM (twice) and as first Medical Director of Olympia Fields Hospital. In that capacity, Doctor McCarty attended every Thursday morning OMM Resident program, and was never late.

The present volume reflects Doctor McCarty's experience and teaching in the area of Ear, Nose, Throat problems. Following a brief **Introduction**, the following sections are developed:

Physiologic Rationale of OMT in ENT Disorders. A brief overview summarizes Doctor McCarty's hypothesis that palpable reflex areas seen in ENT disorders respond to OMT, contributing to improvement in symptoms and supporting the body's ability to heal itself.

Head and Neck Functional Anatomy & Physiology. Concise reviews are provided for Skeletal/ Arthrodial Structures, Ligaments, Muscles, Connective Tissue. Neural Anatomy includes consideration of Upper and Lower Motor Neuron Dysfunction, as well as Autonomic and Cranial Nerve influences. Arterial supply to the head and Venous drainage from the head are discussed. Emphasis is placed on knowledge of lymphatic drainage patterns as an aid in localizing pathological conditions. Principles of Osteopathy in the Cranial Field underlie discussion of Paranasal Sinuses, Eyes, Ears and Throat. Mention of Autonomic Balance concludes the section.

Common ENT Conditions: Dr. McCarty's Osteopathic Findings. Specific recommendations are given for diagnosis and treatment of the Common Cold, Sinusitis, Acute Tonsillitis, Acute and Chronic Otitis Media/Eustachian Tube Dysfunction, Airway Edema and Tension Cephalgia.

Characteristics of ENT Reflex Areas. The numerous reflex areas found in ENT problems are acknowledged to be similar to Chapman's reflexes. The application of OMT requires knowledge of the cranial nerves, blood vessels and lymph glands which supply the various areas of ENT complaints.

Evaluation and Treatment of Reflex Areas. Descriptions accompany illustrations in this section. Included are: Suboccipital Reflex Area-Myofascial Release; Temporal Reflex Area-Inhibitory Technique; Frontal Sinus-Soft Tissue Technique; Sternocleidomastoid Insertion Reflex Area-Myofascial Release; Maxillary Reflex Area-Effleurage; Clavicle and Sternum Reflex Area-Soft Tissue Technique; Cervicothoracic Region-Chin Pivot HVLA; Cervical Region-HVLA; Scalenes-Direct Myofascial Release; Lymphatic Techniques-Patient Seated and Supine; Thoracolumbar Articulatory Technique-Hip Lift and Rocking; Cranial and Sacral Motion Assessment. The arrangement of information is such that a rapid review of Dysfunction, Objective, Discussion help to focus the intention of treatment. Patient position, Physician position and Procedure logically follow.

For a slim volume, a professional lifetime of study, knowledge, practice and wisdom is abundantly reflected. It is a pleasure to utilize this volume in practice since its organization and presentation facilitate rapid recovery of needed information. References are given.❐

Elsewhere in Print

Vaughn B. Inter-examiner reliability in detecting cervical spine dysfunction-A short review. Journal of Osteopathic Medicine, 2002; 5(1): 24-27.

The author acknowledges that results for determining inter-examiner reliability in the detection of cervical spine dysfunction are promising. A continuing need for studies investigating the reliability and validity of diagnostic approaches is stressed. Acknowledgment of TART/ART descriptors indicates acceptability of such criteria. A recommendation for further studies suggests experienced examiners using standardized protocols. Symptomatic populations and patient pain responses in combination with motion palpation should be employed.

Mestan B, Rockwell JA, Foshang TH. Isolated injury of the posterior cruciate ligament: A report of three cases. JNMS: Journal of the Neuromusculoskeletal System, 2002; 10(3): 104-111.

The authors emphasize the uncommon occurrence of isolated injury to the posterior cruciate ligament, citing athletic injuries and motor vehicle accidents as causes. Partial or complete tears as well as tibial bony avulsion have been noted. Diagnosis is significantly enhanced through use of the posterior drawer sign and MRI imaging. Plain films are thought to have limited value. Conservative treatment is discussed at length. Disability is typical with a torn posterior cruciate ligament. Conservative management, in order to be successful, should consist of: local (knee) and regional (hip and ankle) normalization of joint mechanics; reduction of posterior tibial dysfunction; correction of anterior pelvic tilt dysfunction. Emphasis is placed on the use of ligamentous articular balancing and positional release methods in early stages of treatment. These are chosen because of safety for the knee joint. Myofascial release of the hamstring muscles is employed in order to facilitate patient performance of active muscle stretching. Overall goals of rehabilitation include: restoration of full active and passive ranges of motion; redevelopment of neuromuscular function of the involved lower extremity; reduction of weight-bearing forces to the tibiofemoral joint. Surgical reattachment is acknowledged to have the best results for complete tears if performed within 2 months of injury. Whether conservative or surgical treatment is rendered, long-term outcomes can vary greatly. Accelerated degeneration of the knee can occur. Prognosis is influenced by: severity of the initial injury; patient activity level; time from injury to onset of treatment.

Cuthbert SC. Applied Kinesiology and the Myofascia. AK: The International Journal of Applied Kinesiology and Kinesiologic Medicine, 2002; 13: 34-39.

In this essay, the author discusses the importance of myofascial analysis in chiropractic treatment. An extended discussion of percussion to release dysfunctions acknowledges descriptions by Burns, Fulford, Jones, Nimmo, Rolf, Sutherland, Travell and others. Applied Kinesiology solutions offered for myofascial problems acknowledge the relationship of local musculoskeletal dysfunctions to a variety of other phenomena. Specific considerations include: pain, increased neurologic confusion, autonomic arousal, visceral dysfunction and disease and decreased effectiveness of the endocrine and immune systems. Synthesis of approaches is nicely done, and includes methods employed by Travell, Jones and Fulford. A very excellent description of the use of the percussion instrument in concert with the monitoring hand is provided. The value of the percussion instrument in resolving various kinds of myofascial dysfunction is readily acknowledged.

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